

UNIFORM INSPECTION & COMMUNICATION STANDARDS 2010 - 2011

Drive Train & Transmission Systems

DRIVE TRAIN & TRANSMISSION SYSTEMS

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The Automotive Maintenance and Repair Association (AMRA) and MAP do not warrant these materials or guarantee their accuracy, and AMRA and MAP assume no liability for errors.

MAP STANDARDS OF SERVICE

MAP developed standards of service for shops to follow in working with customers. Written from the point of view of customers, and for the use of maintenance and repair shops, the standards expand on the ideas and promises established in MAP's Pledge to Customer

I. Our recommendations are based upon the following definitions.

System Failure - Parts/system indicated are out of manufacturers' specifications, have failed or are unable to perform their normal function as intended or designed by the manufacturers. Service/replacement is required.

Preventive/Scheduled Maintenance - Parts/system are scheduled for service/ replacement per industry standards or are near the end of their useful life and repair/ replacement is recommended in advance of parts/system failure. Service/replacement is suggested.

Improved System Performance - Parts/ system indicated are recommended for repair/ replacement to enhance/improve the vehicle's ability to perform as intended or designed by the manufacturer, or as requested by the customer. Service/replacement is suggested.

II. Training/Criteria Our personnel have acquired auto repair expertise through formal education or work experience. Where appropriate, personnel are moving toward certification (e.g. vehicle manufacturer, ASE, etc.) for the services performed. Continuing education will be supported by all MAP participants.

III. Appropriate Company Approved Inspection

We will perform an appropriate inspection based on MAP Uniform Inspection & Communication Standards.

IV. Written Estimates

Written estimates based on our inspection, in compliance with state and local regulations, will include parts (dollar amount), labor (dollar amount), and the total estimate.

V. Work Authorization

No work will be performed without the customer's prior approval.

VI. Limited Warranty

A minimum limited warranty will be offered of 90 days or 4,000 miles, whichever comes first, covering parts and labor.

VII. Returned Parts

All customers will be entitled to the return of old parts, or if they choose, they may examine the parts prior to leaving the store. Where failed parts are required to be returned to the manufacturer in order to

honor the warranty, the customer will be allowed to examine the parts.

VIII. Classification of Parts

Replaced parts will be identified as new, remanufactured, rebuilt or used. MAP participants will inform the customer and indicate on the estimate and invoice whether a part is new, remanufactured, rebuilt or used.

THE MAP PROCESS - OVERVIEW

Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program comes from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer / recommended maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, Electrical Systems, and Drive Train and Transmissions. Further, revisions to all of these inspection communication standards are continually re-published. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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Falls Church, Virginia 22046

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THE MAP PROCESS - OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-train, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience or the vehicle manufacturer's recommended service interval and must be documented. However, any suggestions must be documented and must be based on substantial and informed experience or the vehicle manufacturer's recommended service interval. NOTE: Vehicle manufacturer service intervals are often categorized as either Normal or Severe. Frequently, motorists are unaware that their driving patterns and habits meet the criteria for following Severe Service schedules. Severe Service is generally defined as, but not limited to one or more of the following conditions: Driving in stop-and-go traffic; frequent short trips; high-speed driving; extreme temperatures; towing or hauling.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

- **Example:** An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
- **Example:** A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

- **Example:** An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
- **Example:** The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement	Reasons to Suggest Repair or Replacement
A. Part no longer performs intended purpose B. Part does not meet a design specification (regardless of performance) C. Part is missing	1. Part is close to the end of its useful life B - Part does not meet a design specification (regardless of performance) (just above discard specifications, or weak; failure likely to occur soon, etc.) 2. To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.) 3. To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM) 4. Technician's recommendation based on substantial and informed experience 5. To comply with maintenance recommended by AMRA / MAP

Reasons to Require Repair or Replacement	Reasons to Suggest Repair or Replacement
NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.	NOTE: Suggested services are <i>always</i> optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVETRAIN AND TRANSMISSION

- NOTE:** When a procedure states that a required or suggested repair or replacement is recommended, the basis for the recommendation **MUST** be explained to the customer. If the customer asks whether there are alternatives to the recommendation, generally acceptable repair/replacement options must be explained, whether performed or not by the shop.
- NOTE:** Whenever transmission or drive-train service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.
- NOTE:** The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Require repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

ACTUATORS (VACUUM)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking (vacuum)	A	Require repair or replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement

Condition	Code	Procedure
Out of adjustment	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

AUTOMATIC TRANSMISSION / TRANSAXLE ASSEMBLIES/CVTS

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service.	A	Require repair or replacement of the automatic transmission / transaxle assembly.
NOTE: It is required that the torque converter and all other failure-related components be inspected for cause and condition. For components not requiring removal of the assembly, refer to the component listing		

AUTOMATIC TRANSMISSION FLUID

Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
Burned	A	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service

Condition	Code	Procedure
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Ā	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct fluid.		
Level incorrect	B	Require correction of fluid level
Oxidized	A	Require replacement of fluid
Varnish deposits present on system components affecting performance	Ā	Further inspection required

AXLES

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement
Bent, beyond specification	B	Require repair or replacement
Broken	A	Require replacement
End play exceeds specifications	B	Require repair or replacement
Flange bent	A	Require replacement
Flange threads stripped	A	Require repair or replacement
Twisted	A	Require replacement
Worn, affecting performance	A	Require repair or replacement

BEARINGS AND RACES

NOTE: When replacing or re-packing bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

Condition	Code	Procedure
Bearing end-play exceeds specifications	B	Require adjustment of bearing, if possible
NOTE: If proper adjustment can't be obtained, require replacement of bearing assembly.		
Bearing rollers, balls or races are worn, pitted, noisy, or feel rough when rotated as an assembly	B	Require replacement of bearing assembly

BELL CRANKS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware

Condition	Code	Procedure
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent, affecting performance	A	Require repair or replacement
Broken	A	Require repair or replacement
Cracked	A	Require repair or replacement
Missing	C	Require replacement
Worn, affecting performance	A	Require repair or replacement

BELL HOUSINGS

Condition	Code	Procedure
Bearing race loose in bore	A	Require repair or replacement
Broken, affecting performance	A	Require repair or replacement
Cracked	A	Require repair or replacement
Dowel pin holes worn, affecting performance	Â	See Dowel Pins, Guides, and Pilot Holes
Leaking Coolant	B	Require Repair or Replacement
NOTE: This condition is found mostly on Hybrid vehicles with a liquid cooled inverter.		
Machined surfaces damaged, affecting performance	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require repair or replacement

BUSHINGS (EXTERNAL)

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available, otherwise, replace bushing
Attaching hardware broken	A	Require repair or replacement of broken part if available, otherwise, replace bushing
Attaching hardware corroded, affecting structural Integrity	A	Require repair or replacement of corroded part if available, otherwise, replace bushing
Attaching hardware incorrect	B	Require repair or replacement of incorrect part if available, otherwise, replace bushing
Attaching hardware loose	A	Require repair or replacement of loose part if available, otherwise, replace bushing
Attaching hardware missing	C	Require repair or replacement of missing part if available, otherwise, replace bushing
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available, otherwise, replace bushing
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of part with damaged threads if available, otherwise, replace bushing
Binding	A	Require repair or replacement
Contaminated	1	Suggest replacement
Deteriorated, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
Distorted, affecting performance	A	Require repair or replacement
Missing	C	Require replacement
Noisy	2	Further inspection required
NOTE: If noise isolated to bushing, suggest repair or replacement. Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.		
Rubber separating from internal metal sleeve on bonded bushing	A	Require replacement
Seized	A	Require replacement
Shifted out of position	B	Require repair or replacement
Split	A	Require replacement
Surface cracking (weather-checked)	A	No service suggested or required
Worn affecting performance	A	Require repair or replacement
Worn, close to the end of Its useful life	1	Suggest replacement

CABLES (SPEEDOMETER)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	2	Suggest repair or replacement of bracket
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	2	Suggest repair or replacement of bracket
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Broken	A	Require replacement
Cracked	B	Require repair or replacement
Disconnected	A	Require repair or replacement
Kinked	A	Require repair or replacement
Melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Routed incorrectly, affecting performance	B	Require repair
Seized	A	Require repair or replacement

CABLES (TV, DETENT AND SHIFT)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bent	A	Require repair or replacement
Binding	A	Require repair or replacement

CARRIER BEARINGS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bearing rollers, balls or races are worn, pitted, noisy, or feel rough when rotated as an assembly	A	Require replacement of bearing assembly
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	2	Suggest repair or replacement of bracket
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket holes elongated, affecting performance	A	Require repair or replacement
Bracket holes elongated, not affecting performance	Â	No service suggested or required
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Cracked	B	Require replacement
Rough (brinelling, spalling)	A	Require replacement
Rubber deteriorated, affecting performance	A	Require replacement
Seized	A	Require replacement

CLUTCH CABLES AND CABLE HOUSINGS

Condition	Code	Procedure
Broken	A	Require replacement
Cable bent	A	Require replacement
Cable binding	A	Require repair or replacement
Cable mounting loose	B	Require repair or replacement
Cable out of adjustment	B	Require repair or replacement
Frayed	B	Require replacement
Housing heat -damaged	1	Suggest replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Seized	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require replacement

CLUTCH DISCS (MANUAL TRANSMISSIONS)

Condition	Code	Procedure
Backing plate cracked	B	Require replacement
Broken	A	Require replacement
Contaminated with oil	A	Require replacement
NOTE: Determine source of oil and correct prior to repair or replacement of clutch disc.		
Damper cushion broken	A	Require replacement
Damper cushion collapsed	A	Require replacement
Damper spring collapsed	A	Require replacement
Damper spring missing	C	Require replacement
NOTE: Not all clutch discs have springs in all spring chambers on the disc.		
Friction material cracked through	B	Require replacement
Friction material flaking or chunking	B	Require replacement
Friction material surface cracking	A	No service suggested or required
Grooved	B	No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required
Ridged	B	No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required
Splines worn, affecting performance	A	Require replacement
Warped, affecting performance.	A	Require replacement
Wear exceeds specifications (where applicable)	B	Require replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance yet close to the end of its useful life	1	Suggest replacement

CLUTCH FORKS

Condition	Code	Procedure
Bent, affecting performance	B	Require replacement
Broken	A	Require repair or replacement
Cracked	B	Require repair or replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance yet close to the end of its useful life	1	Suggest replacement

CLUTCH LINKAGES (MECHANICAL)

Condition	Code	Procedure
Components missing	C	Require replacement of missing components
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage

Condition	Code	Procedure
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement

CLUTCH MASTER CYLINDERS

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket
Cover gasket gummy	A	Require replacement of cover gasket
NOTE: This condition may indicate contaminated fluid. Further inspection required.		
Cylinder leaking fluid from rear of bore	A	Require repair or replacement
Cylinder leaking fluid internally	A	Require replacement
Dust boot missing	C	Require replacement of dust boot
Dust boot punctured	A	Require replacement of dust boot
Dust boot torn	A	Require replacement of dust boot
Fluid level incorrect	B	Require fluid level adjustment
Housing damaged, affecting performance	A	Require repair or replacement
Master cylinder has residue in reservoir	2	Further inspection required
NOTE: Do not replace master cylinder unless it exhibits conditions listed for replacement.		
Pushrod out of adjustment	B	Require Repair or Replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

CLUTCH PEDALS

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement
Bent, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Pedal pad missing	C	Require replacement of pedal pad
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings

CLUTCH PIVOTS

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement

Condition	Code	Procedure
Broken	A	Require repair or replacement
Cracked	B	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require replacement
Worn, not affecting performance, but close to the end of its useful life	2	Suggest replacement

CLUTCH PRESSURE PLATES

Condition	Code	Procedure
Balance weight missing	C	Require replacement
Broken	A	Require replacement
Contact surface distorted	B	Require replacement
Cracks	B	Require replacement
Fingers bent	A	Require replacement
Hard spots	B	Require replacement
Scored	B	Require replacement
Spring rate less than specifications	B	Require replacement
Worn beyond specifications	B	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

CLUTCH RELEASE BEARINGS

Condition	Code	Procedure
Collar broken	A	Require replacement
Cracked	B	Require replacement
Rough when rotated as an assembly	B	Require replacement
Seized	A	Require replacement
Wear exceeds specifications	B	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

Condition	Code	Procedure
Bearing rough when rotated as an assembly	B	Require replacement
Bearing seized	A	Require replacement
Bleeder pipe leaks	A	Require repair or replacement
Carrier assembly worn, affecting performance	A	Require replacement
Collar broken	A	Require replacement
Cracked	B	Require replacement
Housing leaks	A	Require replacement
Inoperative	A	Require replacement
Release binding	A	Require replacement
Spring broken	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require replacement

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

Condition	Code	Procedure
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Condition	Code	Procedure
Binding	A	Require repair or replacement
Bleeder port damaged (not repairable)	A	Require replacement
NOTE: Only required if the hydraulic system must be opened.		
Bleeder port damaged (repairable)	A	Require repair
NOTE: Only required if the hydraulic system must be opened.		
Bleeder screw broken off in slave cylinder	A	Require replacement
NOTE: Only required if the hydraulic system must be opened.		
Bleeder screw seized	A	Require replacement
NOTE: Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made. Only required if the hydraulic system must be opened.		
Bore corroded (pitted)	B	Require replacement
Bore grooved	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

COMPANION FLANGES

Condition	Code	Procedure
Bearing cap bore distorted	A	Require repair or replacement
Bent, affecting performance	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn close to the end of their useful life	1	Suggest replacement
Splines worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement

CONNECTORS

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement

Condition	Code	Procedure
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Protective shield (conduit) missing	C	Suggest repair or replacement
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Transmission connector leaking	See Transmission Assembly	Â
Voltage drop out of specification	A	Require repair or replacement

COOLER BYPASS VALVES

Condition	Code	Procedure
Inoperative	A	Require replacement
Installed incorrectly	A	Require repair
Leaking	A	Require repair or replacement
Restricted	A	Require repair or replacement

COOLER LINES

Condition	Code	Procedure
Abrasion damage, affecting structural integrity	A	Require repair or replacement
Abrasion damage, not affecting structural integrity	Â	No service suggested or required
Application incorrect	B	Require replacement

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Clamp corroded, not reusable	1	Suggest replacement
NOTE: If clamp removed, require replacement.		
Connected incorrectly	A	Require repair
Corroded, affecting structural integrity	A	Require replacement
Corroded, not affecting structural integrity	Â	No service suggested or required
Cracked	B	Require repair or replacement
Fitting type incorrect (such as compression fitting)	B	Require replacement
Flange leaking	A	Require repair or replacement
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement
Leaking	A	Require repair or replacement
Melted	1	Suggest repair or replacement
Missing	C	Require replacement
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement
Protective sleeves damaged	2	Suggest replacement of sleeves
Protective sleeves missing	C	Require replacement of sleeves
Restricted, affecting performance	A	Require repair or replacement
Routed incorrectly	B	Require repair
Swollen	1	Suggest replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Type incorrect	2	Suggest repair or replacement

COOLERS

Condition	Code	Procedure
Air flow obstruction	A	Require repair
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connection leaking	A	Require repair or replacement
Contaminated	A	Require repair or replacement
Corroded	1	Suggest repair or replacement
Fins damaged, affecting performance	A	Require repair or replacement
Fins damaged, not affecting performance	Â	No service suggested or required
Internal restrictions	B	Require repair or replacement
Leaking	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require repair or replacement
Tubes damaged, affecting performance	A	Require repair or replacement
Tubes damaged, not affecting performance	Â	No service suggested or required

CV JOINTS

Condition	Code	Procedure
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Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement
Boot clamp broken	A	Require repair or replacement of clamp
Boot clamp loose	A	Require repair or replacement of clamp
Boot clamp missing	C	Require repair or replacement of clamp
Boot leaking	A	Require replacement of CV boot
NOTE: Further inspection of joint required before replacing boot.		
Boot surface cracked, not leaking	2	Suggest replacement of CV boot
Cage broken	A	Require repair or replacement of CV joint
Housing damaged to the extent that it no longer performs its intended function	A	Require repair or replacement of CV joint
NOTE: Housing assembly may appear blue in color from normal manufacturing process of heat treating the housing.		
Housing worn to the extent that it no longer performs its intended function	A	Require repair or replacement
NOTE: Housing assembly may appear blue in color from normal manufacturing process of heat treating the housing.		
Internal parts binding	A	Require repair or replacement
Internal parts worn	A	Require repair or replacement
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint
Mounting holes elongated	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service.	A	Require repair or replacement of the differential assembly
NOTE: For components not requiring removal of the assembly, refer to the component listing.		

DIFFERENTIAL FLUID

Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement

Condition	Code	Procedure
NOTE: Determine and correct cause.		
Burned	Ā	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Ā	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level
Oxidized	A	Require replacement of fluid
Rubber master/ clutch cylinder cover gasket distorted or gummy	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Varnish deposits present on system components affecting performance	Ā	Further inspection required

DIP STICK TUBES

Condition	Code	Procedure
Broken	A	Require repair or replacement
Check ball missing	C	Require repair or replacement
Cracked	B	Require repair or replacement
Hold down bracket broken	A	Require repair or replacement
Hold down bracket missing	C	Require replacement
Leaking	B	Require repair or replacement

Condition	Code	Procedure
Missing	C	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

DIP STICKS (FLUID LEVEL INDICATORS)

Condition	Code	Procedure
Application incorrect	B	Require replacement
Broken	A	Require replacement
Compressed	A	Require repair or replacement
Missing	C	Require replacement
Modified	A	Require replacement
Stretched	A	Require repair or replacement

DOWEL PINS, GUIDES AND PILOT HOLES

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Cracked	A	Require repair or replacement
Distorted	A	Require repair or replacement
Missing	C	Require replacement
Positioned incorrectly	B	Require repair or replacement
Stepped	A	Require repair or replacement
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement

DRAIN PLUGS AND GASKETS

Condition	Code	Procedure
Leaking	A	Require repair or replacement
NOTE: Require inspection of mating and sealing surface and repair or replace as necessary.		
Missing	C	Require replacement
Threads Damaged	A	Require repair or replacement

DRIVE SHAFT FLANGES

Condition	Code	Procedure
Bearing cap bore distorted	A	Require repair or replacement
Bent, affecting performance	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn close to the end of their useful life	1	Suggest replacement
Splines worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts

Condition	Code	Procedure
Yoke damaged, affecting performance	A	Require repair or replacement

DRIVE SHAFTS AND HALF SHAFTS

Condition	Code	Procedure
Balance weight missing	C	Require repair or replacement
Bearing cap bore distorted	A	Require repair or replacement
Bent	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke
Out of balance	A	Require repair or replacement
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn, affecting performance	A	Require repair or replacement
Splines worn, not affecting performance, but close to the end of their useful life	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement of Yoke

DUST BOOTS

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement
Leaking	A	Require repair or replacement
Missing	C	Require replacement
Torn	A	Require replacement
Weather checked, surface cracked	Â	No service suggested or required

ENGINE MOUNTS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require replacement
Leaking (hydraulic mount)	A	Require replacement
Mounting hole worn, affecting performance	A	Require replacement
Mounting hole worn, not affecting performance	Â	No service suggested or required
Rubber deteriorated, affecting performance	A	Require replacement
Rubber deteriorated, not affecting performance	Â	No service suggested or required
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

EXCITER RINGS

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement
Bent	B	Require replacement

Condition	Code	Procedure
Contaminated, affecting performance	A	Require repair. Identify and correct cause
Cracked	B	Require replacement
Loose	A	Require replacement of worn parts
Missing	C	Require replacement
Number of teeth incorrect	B	Require replacement
Teeth broken	A	Require replacement
Teeth damaged, affecting performance	A	Require replacement

FILLER TUBES

Condition	Code	Procedure
Broken	A	Require repair or replacement
Check ball missing	C	Require repair or replacement
Cracked	B	Require repair or replacement
Hold down bracket broken	A	Require repair or replacement
Hold down bracket missing	C	Require replacement
Leaking	A	Require repair or replacement
Missing	C	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

FILTERS AND SCREENS

Condition	Code	Procedure
At service interval	3	Suggest replacement
Bent, affecting performance	A	Require repair or replacement
Exceeding service interval	3	Suggest replacement
Missing	C	Require replacement
Near service interval	3	Suggest replacement
Restricted	A	Require repair or replacement
NOTE: Further inspection may be required to determine the source of restriction or contamination.		
Torn	A	Require replacement
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement

FLANGES

Condition	Code	Procedure
Bearing cap bore distorted	A	Require repair or replacement
Bent, affecting performance	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn close to the end of their useful life	1	Suggest replacement
Splines worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement

Condition	Code	Procedure
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement

FLEX PLATES

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement
Bent, not affecting performance	Â	No service suggested or required
Bolt or stud holes elongated	B	Require replacement
Broken	A	Require replacement
Cracked	B	Require replacement
Ring gear worn close to the end of its useful life	1	Suggest replacement
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement
Weights missing	A	Require repair or replacement

FLUID LEVEL INDICATORS

Condition	Code	Procedure
Application incorrect	B	Require replacement
Broken	A	Require replacement
Compressed	A	Require repair or replacement
Missing	C	Require replacement
Modified	A	Require replacement
Stretched	A	Require repair or replacement

FLUIDS AND LUBRICANTS

Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
Burned	Â	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct brake fluid.		

Condition	Code	Procedure
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Ā	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level
Oxidized	A	Require replacement of fluid
Rubber master/ clutch cylinder cover gasket distorted or gummy	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Varnish deposits present on system components affecting performance	Ā	Further inspection required

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Cracked (other than mounting area)	A	Require repair or replacement of hardware
NOTE: Some manufacturers allow slight surface cracking in the friction surface.		
Cracks in mounting area	B	Require replacement
Hard spots	B	Require repair or replacement
Ring gear teeth worn, affecting performance	A	Require replacement of ring gear
Runout exceeds specifications	B	Require repair or replacement
Scored	B	Require repair or replacement
Surface cracks after resurfacing to manufacturer's minimum specifications	B	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wear exceeds specifications	B	Require replacement
Worn, affecting performance	A	Require repair or replacement
Worn, not affecting performance, but close to the end of its useful life	1	Suggest repair or replacement

FORCE MOTORS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	1	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

GASKETS

Condition	Code	Procedure
Leaking	A	Require repair or replacement
NOTE: Require inspection of mating and sealing surface and repair or replace as necessary.		

GUIDES

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Cracked	A	Require repair or replacement
Distorted	A	Require repair or replacement
Missing	C	Require replacement

Condition	Code	Procedure
Positioned incorrectly	B	Require repair or replacement
Stepped	A	Require repair or replacement
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement

HALF SHAFTS

Condition	Code	Procedure
Balance weight missing	C	Require repair or replacement
Bearing cap bore distorted	A	Require repair or replacement
Bent	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Out of balance	A	Require repair or replacement
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn, affecting performance	A	Require repair or replacement
Splines worn, not affecting performance, but close to the end of their useful life	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement of yoke

HOSES, LINES, AND TUBES

Condition	Code	Procedure
Application incorrect	B	Require replacement
At or beyond service interval	3	Suggest replacement
Connected incorrectly	A	Require repair
Corroded, not reusable	1	Suggest replacement
Cracked line or tube	A	Require replacement
Hard hose	1	Suggest replacement
Inner fabric (webbing) damaged	A	Require replacement
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement
Leaking	A	Require repair or replacement
Melted	1	Suggest repair or replacement
Missing	C	Require replacement
Outer covering damaged	1	Suggest replacement
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement
Protective sleeves damaged	2	Suggest replacement of sleeves
Protective sleeves missing	2	Suggest replacement of sleeves
Restricted, affecting performance	A	Require repair or replacement
Restricted, not affecting performance	2	Suggest repair or replacement
Routed incorrectly	2	Suggest replacement
Safety clip missing	C	Require replacement
Spongy	1	Suggest repair or replacement
Stripped	A	Require replacement
Surface cracked (weather-checked)	1	Suggest repair or replacement
Swollen	B	Require replacement

Condition	Code	Procedure
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Type incorrect	1	Suggest repair or replacement

HOUSINGS (BELL, CASE, TAIL(EXTENSION) AND AUXILIARY)

Condition	Code	Procedure
Bearing race loose in bore	A	Require repair or replacement
Broken, affecting performance	A	Require repair or replacement
Cracked	B	Require repair or replacement
Dowel pin holes worn, affecting performance	A	Require repair or replacement
Machined surfaces damaged, affecting performance	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require repair or replacement

HYDRAULIC FLUID

Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
Burned	Â	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct brake fluid.		
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Â	No service suggested or required
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level
Oxidized	A	Require replacement of fluid
Rubber master/ clutch cylinder cover gasket distorted or gummy	A	Require service

Condition	Code	Procedure
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Varnish deposits present on system components affecting performance	Â	Further inspection required

INTERMEDIATE SHAFT SUPPORT BEARINGS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bearing rollers, balls or races are worn, pitted, noisy, or feel rough when rotated as an assembly	A	Require replacement of bearing assembly
Bracket bent, affecting performance	A	Require repair or replacement
Bracket bent, not affecting performance	Â	No service suggested or required
Bracket broken, affecting performance	A	Require replacement
Bracket broken, not affecting performance	2	Suggest repair or replacement of bracket
Bracket corroded, affecting performance	A	Require repair or replacement
Bracket corroded, not affecting performance	2	Suggest repair or replacement
Bracket cracked, affecting performance	A	Require repair or replacement
Bracket cracked, not affecting performance	1	Suggest repair or replacement
Bracket holes elongated, affecting performance	A	Require repair or replacement
Bracket holes elongated, not affecting performance	Â	No service suggested or required
Bracket loose, affecting performance	A	Require repair or replacement
Bracket loose, not affecting performance	1	Suggest repair or replacement
Bracket missing	C	Require replacement
Cracked	B	Require replacement
Rough (brinelling, spalling)	A	Require replacement
Rubber deteriorated, affecting performance	A	Require replacement
Seized	A	Require replacement

KEY INTERLOCK SYSTEMS

NOTE: See: Actuators (Electrical), Cables, Linkages (External), Switches

LIMITED SLIPS

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service.	A	Require repair or replacement of the differential assembly.
NOTE: For components not requiring removal of the assembly, refer to the component listing.		

LINES

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Condition	Code	Procedure
Application incorrect	B	Require replacement
At or beyond service interval	3	Suggest replacement
Connected incorrectly	A	Require repair
Corroded, not reusable	1	Suggest replacement
Cracked line or tube	A	Require replacement
Hard hose	1	Suggest replacement
Inner fabric (webbing) damaged	A	Require replacement
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement
Leaking	A	Require repair or replacement
Melted	1	Suggest repair or replacement
Missing	C	Require replacement
Outer covering damaged	1	Suggest replacement
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement
Protective sleeves damaged	2	Suggest replacement of sleeves
Protective sleeves missing	C	Suggest replacement of sleeves
Restricted, affecting performance	A	Require repair or replacement
Restricted, not affecting performance	2	Suggest repair or replacement
Routed incorrectly	B	Suggest replacement
Safety clip missing	C	Require replacement
Spongy	1	Suggest repair or replacement
Stripped	A	Require replacement
Surface cracked (weather-checked)	I	Suggest repair or replacement
Swollen	B	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Type incorrect	2	Suggest repair or replacement

LINKAGES (EXTERNAL)

Condition	Code	Procedure
Components missing	C	Require replacement of missing components
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement

LOCKING HUB ASSEMBLIES

Condition	Code	Procedure
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation.		
Loose	B	Require repair or replacement
Seized in any position	A	Require repair or replacement

LOCKING HUB CONTROL KNOBS

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement
Missing	C	Require replacement
Worn, affecting performance	A	Require replacement

LUBRICANTS

Condition	Code	Procedure
Additive Depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
At service interval	3	Suggest replacement
Beyond service interval	3	Suggest replacement
Burned	Â	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correctly specified hydraulic fluid.		
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level
Near service interval	3	Suggest replacement
Oxidized	A	Require replacement of fluid
Rubber master cylinder cover gasket distorted and gummy	A	Require service
NOTE: If a fluid other than brake fluid is present in the system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct brake fluid.		

MANUAL TRANSMISSION FLUID

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Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
Burned	Â	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct brake fluid.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Â	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
Fluid discolored	Â	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level
Oxidized	A	Require replacement of fluid
Rubber master/ clutch cylinder cover gasket distorted or gummy	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Varnish deposits present on system components affecting performance	Â	Further inspection required

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

Condition	Code	Procedure
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Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service.	A	Require repair or replacement of the manual transmission / transaxle assembly.
NOTE: For components not requiring removal of the assembly, refer to the component listing.		

METAL CLAD SEALS

Condition	Code	Procedure
Leaking	A	Require repair or replacement
NOTE: Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.		

METALASTIC JOINTS

NOTE: These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

Condition	Code	Procedure
Drive flange bent	A	Require replacement
Drive flange damaged, affecting performance	A	Require replacement
Rubber drive joint cracked	2	Suggest replacement
Rubber drive joint damaged, affecting performance	A	Require replacement
Rubber drive joint split between mounting holes	A	Require replacement
Rubber drive joint torn at mounting holes	A	Require replacement
Rubber drive joint weather-cracked	A	No service suggested or required

MODULATOR PINS

Condition	Code	Procedure
Application incorrect	B	Require replacement
Missing	C	Require replacement

MODULATORS

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement
Contaminated (water, fuel, etc.)	A	Require replacement
NOTE: Further inspection is required to determine the cause of the contamination.		
Housing cracked	A	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking fluid externally	A	Require repair or replacement
Leaking fluid internally	A	Require replacement
Leaking vacuum	A	Require replacement

Condition	Code	Procedure
Nipple broken	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require replacement
Leaking (hydraulic mount)	A	Require replacement
Mounting hole worn, affecting performance	A	Require replacement
Mounting hole worn, not affecting performance	A	No service suggested or required
Rubber deteriorated, affecting performance	A	Require replacement
Rubber deteriorated, not affecting performance	A	No service suggested or required
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

ODOMETER DRIVES (MECHANICAL)

Condition	Code	Procedure
Application incorrect	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Teeth broken	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

ODOMETER HEADS (MECHANICAL)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		

Condition	Code	Procedure
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Noisy	2	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

OIL PANS

Condition	Code	Procedure
Bent, interfering with filter or other internal components	A	Require repair or replacement
Leaking	A	Require repair or replacement

PANS

Condition	Code	Procedure
Bent, interfering with filter or other internal components	A	Require repair or replacement
Leaking	A	Require repair or replacement

PILOT HOLES

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Cracked	A	Require repair or replacement
Distorted	A	Require repair or replacement
Missing	C	Require replacement
Positioned incorrectly	B	Require repair or replacement
Stepped	A	Require repair or replacement
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement

PRESSURE PLATES

Condition	Code	Procedure
Balance weight missing	C	Require replacement
Broken	A	Require replacement
Contact surface distorted	B	Require replacement
Cracks	B	Require replacement
Fingers bent	A	Require replacement
Hard spots	B	Require replacement
Scored	B	Require replacement
Spring rate less than specifications	B	Require replacement

Condition	Code	Procedure
Worn beyond specifications	B	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

PRESSURE SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

RACES

NOTE: When replacing or re-packing bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

Condition	Code	Procedure
Bearing end-play exceeds specifications	B	Require adjustment of bearing, if possible If proper adjustment cannot be obtained, require replacement of bearing assembly
NOTE: When replacing or re-packing bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions		
Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly	B	Require replacement of bearing assembly
NOTE: When replacing or re-packing bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions		

RUBBER JOINTS (METALASTIC)

NOTE: These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-Jug drive flange. They may be equipped with a centering ball or pin.

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement
Drive flange damaged, affecting performance	A	Require replacement
Rubber drive joint cracked	2	Suggest replacement
Rubber drive joint damaged, affecting performance	A	Require replacement
Rubber drive joint split between mounting holes	A	Require replacement
Rubber drive joint torn at mounting holes	A	Require replacement
Rubber drive joint weather-cracked	Å	No service suggested or required

SCREENS

Condition	Code	Procedure
At service interval	3	Suggest replacement
Bent, affecting performance	A	Require repair or replacement
Exceeding service interval	3	Suggest replacement
Missing	C	Require replacement
Near service interval	3	Suggest replacement
Restricted	A	Require repair or replacement
NOTE: Further inspection may be required to determine the source of restriction or contamination.		
Torn	A	Require replacement
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement

SEALS (METAL CLAD)

Condition	Code	Procedure
Leaking	A	Require repair or replacement
NOTE: Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.		

SEALS

Condition	Code	Procedure
Leaking	A	Require repair or replacement
NOTE: Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.		

SELECTOR INTERLOCK SYSTEMS

NOTE: See: Actuators (Electrical), Cables, Linkages (External), Switches

Condition	Code	Procedure
Binding	A	Require repair or replacement
Broken	A	Require repair or replacement
Components missing	C	Require replacement of missing components
Loose, affecting performance	A	Require repair or replacement
Out of adjustment	B	Require repair
Worn, affecting performance	A	Require repair or replacement

SENSORS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation or out of specification.		
Leaking (vacuum/fluid/air)	A	Require replacement
Out of adjustment	B	Further inspection required

Condition	Code	Procedure
NOTE: Follow OEM recommended adjustment procedures. Repair or replace if out of specification.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

SERVOS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking (vacuum)	A	Require repair or replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage

Condition	Code	Procedure
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

NOTE: See: Actuators (Electrical), Cables, Linkages (External), Switches

Condition	Code	Procedure
Binding	A	Require repair or replacement
Broken	A	Require repair or replacement
Components missing	C	Require replacement of missing components
Loose, affecting performance	A	Require repair or replacement
Out of adjustment	B	Require repair
Worn, affecting performance	A	Require repair or replacement

SIDE COVERS

Condition	Code	Procedure
Bent, interfering with filter or other internal components	A	Require repair or replacement
Leaking	A	Require repair or replacement

SLIP YOKES

Condition	Code	Procedure
Bearing cap bore distorted	A	Require repair or replacement
Bent	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Retainer strap bent	A	Require replacement of retainer strap

Condition	Code	Procedure
Slip yoke broken	A	Require replacement
Splines worn close to the end of their useful life	1	Suggest replacement
Splines worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement

SOLENOIDS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted, affecting performance	A	Require repair or replacement.
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement.
Inoperative	A	Require replacement.
NOTE: Inoperative includes intermittent operation.		
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	Require repair or replacement.
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement.
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	1	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

Condition	Code	Procedure
Air gap incorrect	B	Require adjustment or replacement

Condition	Code	Procedure
NOTE: If a sensor is not adjustable, further inspection is required to identify and correct cause.		
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware threads damaged	A	Require repair or replacement of hardware
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Contaminated	A	Require repair or replacement
NOTE: Determine source of contamination, such as metal particles or water. Require repair or replacement.		
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation. Some components may be serviceable; check for accepted cleaning procedure.		
Leaking	B	Require repair or replacement
Loose	A	Require repair or replacement
Missing	C	Require replacement
Resistance out of specification	B	Require repair or replacement
Sensor housing cracked	2	Suggest replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead misrouted	B	Require re-routing according to vehicle manufacturer's specifications
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

SPEEDOMETER- DRIVEN GEAR HOUSING

Condition	Code	Procedure
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Condition	Code	Procedure
Application incorrect	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Teeth broken	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL)

Condition	Code	Procedure
Application incorrect	B	Require replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking	B	Require repair or replacement
Missing	C	Require replacement
Teeth broken	A	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn close to the end of its useful life	1	Suggest replacement
Worn, affecting performance	A	Require replacement

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement

Condition	Code	Procedure
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Noisy	2	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

SPEEDOMETERS/ODOMETERS (ELECTRONIC)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Leaking	B	Require replacement
Lens broken	A	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only.		
Lens cloudy	2	Suggest repair or replacement
NOTE: If lens is available as a separate part, suggest replacement of lens only.		
Lens missing	C	Require repair or replacement
NOTE: If lens is available as a separate part, require replacement of lens only .		
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.		
Mechanical head noisy	2	Suggest repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement

Condition	Code	Procedure
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn	1	Suggest replacement

TONE WHEELS

NOTE: If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement
Bent	B	Require replacement
Contaminated, affecting performance	A	Require repair. Identify and correct cause
Cracked	A	Require replacement
Loose	A	Require replacement of worn parts
Missing	C	Require replacement
Number of teeth incorrect	B	Require replacement
Teeth broken	A	Require replacement
Teeth damaged, affecting performance	A	Require replacement

TOOTHED RINGS (TONE WHEEL)

NOTE: If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement
Bent	B	Require replacement
Contaminated, affecting performance	A	Require repair. Identify and correct cause
Cracked	A	Require replacement
Loose	A	Require replacement of worn parts
Missing	C	Require replacement
Number of teeth incorrect	B	Require replacement
Teeth broken	A	Require replacement
Teeth damaged, affecting performance	A	Require replacement

TORQUE CONVERTERS

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement
Cover shell damaged, affecting performance	A	Require replacement
Does not meet stall speed specification	B	Require replacement
End play exceeds specifications	B	Require replacement
Hub broken	A	Require replacement
Hub cracked	A	Require replacement
Internal component failure	A	Require replacement
Leaking	B	Require repair or replacement
Pilot broken	A	Require replacement
Pilot worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement

Condition	Code	Procedure
Threads stripped (threads missing)	A	Require replacement
Weights missing	C	Require replacement

TRANSAXLE MOUNTS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require replacement
Leaking (hydraulic mount)	A	Require replacement
Mounting hole worn, affecting performance	A	Require replacement
Mounting hole worn, not affecting performance	Â	No service suggested or required
Rubber deteriorated, affecting performance	A	Require replacement
Rubber deteriorated, not affecting performance	Â	No service suggested or required
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

TRANSDUCERS (TRANSMISSION)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation or out of specification.		
Leaking (vacuum/fluid/air)	A	Require replacement
Out of adjustment	B	Further inspection required
NOTE: Follow OEM recommended adjustment procedures. Repair or replace if out of specification.		
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

TRANSFER CASE ASSEMBLIES

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service.	A	Require repair or replacement of the transfer case differential assembly
NOTE: For components not requiring removal of the assembly, refer to the component listing.		

TRANSFER CASE FLUID

Condition	Code	Procedure
Additive depletion	A	Require replacement of fluid
Application incorrect	B	Require replacement
NOTE: Determine and correct cause.		
Burned	Â	Further inspection required
NOTE: Fluid that is burned indicates a serious problem. Determine and correct the cause.		
Contaminated, for example, fluid other than the specified fluid present	B	Require service
NOTE: If a fluid other than the specified fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill following OEM specified procedure with the correct hydraulic fluid.		
Contaminated, for example, fluid other than the specified fluid present	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct brake fluid.		
Fluid at or beyond service interval	3	Suggest replacement
Fluid discolored	Â	No service suggested or required
NOTE: Further testing necessary to determine condition of fluid.		
Fluid incorrect	B	Require service
NOTE: If a fluid other than the correctly specified fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.		
Level incorrect	B	Require correction of fluid level

Condition	Code	Procedure
Oxidized	A	Require replacement of fluid
Rubber master/ clutch cylinder cover gasket distorted or gummy	A	Require service
NOTE: If an incorrect fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines, 3) repair or replace all components having rubber parts, and 4) fill with correct fluid.		
Varnish deposits present on system components affecting performance	Â	Further inspection required

TRANSMISSION COOLERS

Condition	Code	Procedure
Air flow obstruction	A	Require repair
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connection leaking	A	Require repair or replacement
Contaminated	A	Require repair or replacement
Corroded	1	Suggest repair or replacement
Fins damaged, affecting performance	A	Require repair or replacement
Fins damaged, not affecting performance	Â	No service suggested or required
Internal restrictions	B	Require repair or replacement
Leaking	B	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require repair or replacement
Tubes damaged, affecting performance	A	Require repair or replacement
Tubes damaged, not affecting performance	Â	No service suggested or required

TRANSMISSION MOUNTS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Broken	A	Require replacement
Leaking (hydraulic mount)	A	Require replacement
Mounting hole worn, affecting performance	A	Require replacement
Mounting hole worn, not affecting performance	Â	No service suggested or required
Rubber deteriorated, affecting performance	A	Require replacement
Rubber deteriorated, not affecting performance	Â	No service suggested or required
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

TRANSMISSION PANS

Condition	Code	Procedure
Bent, interfering with filter or other Internal components	A	Require repair or replacement

Condition	Code	Procedure
Leaking	A	Require repair or replacement

TRANSMISSION RANGE INDICATORS (PRNDL)

Condition	Code	Procedure
Binding	A	Require repair or replacement
Broken	A	Require repair or replacement
Components missing	C	Require replacement of missing components
Loose, affecting performance	A	Require repair or replacement
Out of adjustment	B	Require repair
Worn, affecting performance	A	Require repair or replacement

TUBES

Condition	Code	Procedure
Application incorrect	B	Require replacement
At or beyond service interval	3	Suggest replacement
Connected incorrectly	A	Require repair
Corroded, not reusable	1	Suggest replacement
Cracked line or tube	A	Require replacement
Hard hose	1	Suggest replacement
Inner fabric (webbing) damaged	A	Require replacement
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement
Leaking	A	Require repair or replacement
Melted	1	Suggest repair or replacement
Missing	C	Require replacement
Outer covering damaged	1	Suggest replacement
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement
Protective sleeves damaged	2	Suggest replacement of sleeves
Protective sleeves missing	C	Suggest replacement of sleeves
Restricted, affecting performance	A	Require repair or replacement
Restricted, not affecting performance	2	Suggest repair or replacement
Routed incorrectly	B	Suggest replacement
Safety clip missing	C	Require replacement
Spongy	1	Suggest repair or replacement
Stripped	A	Require replacement
Surface cracked (weather-checked)	1	Suggest repair or replacement
Swollen	B	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Type incorrect	2	Suggest repair or replacement

UNIVERSAL JOINTS (CARDAN OR CROSS TYPE)

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Bearing cap distorted	B	Require replacement
Binding	A	Require replacement

Condition	Code	Procedure
Cross (trunion) worn, affecting performance	A	Require replacement
Double cardan centering ball damaged	A	Require replacement
Double cardan centering ball worn, affecting performance	A	Require replacement
Double cardan centering spring broken	A	Require replacement
Double cardan centering spring missing	C	Require replacement
Double cardan centering spring weak	A	Require replacement
End cap seal cracked	2	Suggest replacement
End cap seal missing	C	Require replacement of seal
Grease fitting broken	A	Require replacement of grease fitting
NOTE: A broken grease fitting does not require replacement of the U-Joint.		
Grease fitting missing	C	Require replacement of grease fitting
NOTE: A missing grease fitting does not require replacement of the U-Joint.		
Rust-colored powder around end cap seals	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Worn, affecting performance	A	Require replacement

VACUUM CONTROLS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking (vacuum)	A	Require repair or replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage

Condition	Code	Procedure
Linkage binding, not affecting performance	1	Require repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

VACUUM HOSES

Condition	Code	Procedure
Application incorrect	B	Require replacement
At or beyond service interval	3	Suggest replacement
Connected incorrectly	A	Require repair
Corroded, not reusable	1	Suggest replacement
Cracked line or tube	A	Require replacement
Hard hose	1	Suggest replacement
Inner fabric (webbing) damaged	A	Require replacement
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement
Leaking	A	Require repair or replacement
Melted, affecting performance	B	Require repair or replacement
Missing	C	Require replacement
Outer covering damaged	1	Suggest replacement
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement
Protective sleeves damaged	2	Suggest replacement of sleeves
Protective sleeves missing	C	Suggest replacement of sleeves
Restricted, affecting performance	A	Require repair or replacement
Restricted, not affecting performance	2	Suggest repair or replacement
Routed incorrectly	B	Suggest replacement
Safety clip missing	C	Require replacement
Spongy	1	Suggest repair or replacement
Stripped	A	Require replacement
Surface cracked (weather-checked)	1	Suggest repair or replacement
Swollen	B	Require replacement
Threads damaged	A	Require repair or replacement

Condition	Code	Procedure
Threads stripped (threads missing)	A	Require replacement
Type incorrect	2	Suggest repair or replacement

VACUUM MOTORS

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Inoperative	A	Require replacement
NOTE: Inoperative includes intermittent operation.		
Leaking (vacuum)	A	Require repair or replacement
Linkage bent, affecting performance	A	Require repair or replacement of linkage
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage
Linkage binding, affecting performance	A	Require repair or replacement of linkage
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage
Linkage broken	A	Require repair or replacement of linkage
Linkage loose, affecting performance	A	Require repair or replacement of linkage
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage
Linkage missing	C	Require replacement
Linkage noisy	2	Suggest repair or replacement
Missing	C	Require replacement
Noisy	2	Suggest repair or replacement
Out of adjustment	B	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement

Condition	Code	Procedure
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

VACUUM-OPERATED SWITCHES

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Binding, affecting performance	A	Require repair or replacement
Binding, not affecting performance	2	Suggest repair or replacement
Broken	A	Require repair or replacement
Burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Cracked, affecting performance	A	Require repair or replacement
Cracked, not affecting performance	1	Suggest repair or replacement
Leaking	B	Require repair or replacement
Malfunctioning	A	Require repair or replacement
NOTE: Includes inoperative, intermittent operation, or failure to perform all functions.		
Melted, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Melted, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Missing	C	Require replacement
Out of adjustment	B	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		

Condition	Code	Procedure
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Won't return	A	Require repair or replacement
Worn affecting performance	B	Require replacement

VEHICLE SPEED SENSORS

Condition	Code	Procedure
Air gap incorrect	B	Require adjustment or replacement
NOTE: If a sensor is not adjustable, further inspection is required to identify and correct cause.		
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware threads damaged	A	Require repair or replacement of hardware
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Contaminated	A	Require repair or replacement
NOTE: Determine source of contamination, such as metal particles or water. Require repair or replacement.		
Inoperative	B	Require repair or replacement
NOTE: Inoperative includes intermittent operation. Some components may be serviceable; check for accepted cleaning procedure.		
Leaking	A	Require repair or replacement
Loose	A	Require repair or replacement
Missing	C	Require replacement
Resistance out of specification	B	Require repair or replacement
Sensor housing cracked	2	Suggest replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement

Condition	Code	Procedure
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement
Wire lead corroded	A	Require repair or replacement
Wire lead misrouted	B	Require re-routing according to vehicle manufacturer's specifications
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

VENTS

Condition	Code	Procedure
Broken	A	Require replacement
Missing	C	Require replacement
Plugged	A	Require repair or replacement
NOTE: A plugged vent may force fluid past the seal.		

VIBRATION DAMPERS

Condition	Code	Procedure
Broken	A	Require replacement
Missing	C	Require replacement
Out of position	B	Require repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes. Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. **DO NOT** lubricate threads unless specified by the vehicle manufacturer.

Condition	Code	Procedure
Bent	A	Require replacement
Broken	A	Require replacement
NOTE: Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.		
Loose	A	Require repair or replacement of affected component
Lug nut installed backward	B	Require repair or replacement
Lug nut mating surface dished	A	Require replacement of nut
Lug nut mating type incorrect	B	Require replacement of nut
Lug nut rounded	A	Require replacement of nut
NOTE: Only required if removing wheel.		
Lug nut seized	A	Require replacement of nut

Condition	Code	Procedure
NOTE: Only required if removing wheel.		
Stud incorrect	B	Require replacement of stud
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement

WHEEL SPEED SENSORS

Condition	Code	Procedure
Air gap incorrect	B	Require adjustment or replacement
NOTE: If a sensor is not adjustable, further inspection is required to identify and correct cause.		
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware threads damaged	A	Require repair or replacement of hardware
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Connector missing	C	Require replacement
Contaminated	A	Require repair or replacement
NOTE: Determine source of contamination, such as metal particles or water. Require repair or replacement.		
Inoperative	A	Require repair or replacement
NOTE: Inoperative includes intermittent operation. Some components may be serviceable; check for accepted cleaning procedure.		
Leaking	B	Require repair or replacement
Loose	A	Require repair or replacement
Missing	C	Require replacement
Resistance out of specification	B	Require repair or replacement
Sensor housing cracked	2	Suggest replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
Wire lead conductors exposed	B	Require repair or replacement

Condition	Code	Procedure
Wire lead corroded	A	Require repair or replacement
Wire lead misrouted	B	Require re-routing according to vehicle manufacturer's specifications
Wire lead open	A	Require repair or replacement
Wire lead shorted	A	Require repair or replacement

WIRING HARNESSES AND CONNECTORS

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement
Attaching hardware broken	A	Require repair or replacement of hardware
Attaching hardware missing	C	Require replacement of hardware
Attaching hardware not functioning	A	Require repair or replacement of hardware
Connector (Weatherpack type) leaking	A	Require repair or replacement
Connector broken	A	Require repair or replacement
Connector melted	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Insulation damaged, conductors exposed	A	Require repair or replacement
Insulation damaged, conductors not exposed	1	Suggest replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Protective shield (conduit) missing	C	Suggest repair or replacement
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal burned, not affecting performance	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, affecting performance	A	Require repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Terminal corroded, not affecting performance	1	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Transmission connector leaking	See Transmission Assembly	A
Voltage drop out of specification	A	Require repair or replacement

YOKES AND SLIP YOKES

Condition	Code	Procedure
Bearing cap bore distorted	A	Require repair or replacement
Bent	A	Require replacement
Bolt holes elongated	A	Require repair or replacement
Bushing or seal surface worn, affecting performance	A	Require repair or replacement
Leaking through soft yoke plug	A	Require repair or replacement of soft yoke plug
Retainer strap bent	A	Require replacement of retainer strap
Slip yoke broken	A	Require replacement
Splines worn close to the end of their useful life	1	Suggest replacement
Splines worn, affecting performance	A	Require replacement
Threads damaged	A	Require repair or replacement
Threads stripped (threads missing)	A	Require replacement
U-bolt damaged, affecting performance	A	Require replacement of U-bolts
Yoke damaged, affecting performance	A	Require repair or replacement

REASON CODE EXPLANATION

Code	Reason
Required	
A	Part No Longer Performs Intended Purpose
B	Part Does Not Meet A Design Specification (Regardless Of Performance)
C	Part Is Missing
Suggested/Optional	
1	Part Is Close To The End Of Its Useful Life
2	To Address A Customer Need, Convenience Or Request
3	To Comply With Maintenance Recommended By The Vehicle's Original Equipment Manufacturer
4	Technician's Recommendation Based On Substantial And Informed Experience
5	To Comply With Maintenance Recommended By AMRA/MAP

AUTOMOTIVE TERMINOLOGY & DEFINITIONS

ACTUATOR

a control device that delivers mechanical action in response to a vacuum or electrical signal; anything that the engine control computer uses to do something, such as trigger fuel injection or fire a spark plug. Most actuators on a computercontrolled engine system are activated by grounding their circuits rather than by actively powering them, since that protects the computer from short circuits.

ADDITIVE

in automotive terminology, a substance added to a liquid, such as engine oil, transmission fluid, gear oil or coolant to enhance its properties.

AUTO SHIFT MANUAL TRANSMISSION AND SELECT SHIFT MANUAL TRANSMISSION

select shift manual (SSM) and auto shift manual (ASM) use a combination of auto-clutch and shift-by-wire electronic control system technology to provide the customer a fun-to-shift experience along with significant fuel economy improvements over a base manual transmission. The Select Shift Manual mode allows a customer to command gear changes according to his/her

personal preference like a conventional manual transmission. The Auto Shift Manual mode provides the customer automatic gear shifting much like an automatic transmission.

AUTOMATIC TRANSMISSION FLUID (ATF)

the oil that is used in an automatic transmission.

AUTOMATIC TRANSMISSION

a transmission that changes forward gears automatically.

AXLE HOUSING

an enclosure for the differential and drive axles.

AXLE

a rotating shaft that rotates another part, such as a wheel.

BALL BEARING

a friction-reducing bearing that uses a series of steel balls held between inner and outer bearing races such as in a roller clutch.

BAND

in an automatic transmission, a device used to prevent members of a planetary gearset from rotating.

BEARING RACE

the machined surface of a bearing assembly against which the needles, balls or rollers ride. The outer race is also called a cup.

BEARING

part that supports and reduces friction between a stationary and moving part or two moving parts.

BELL HOUSING

connects the engine to the transmission and encloses the clutch assembly. It also provides mounting points for part of the clutch release mechanism.

CARDAN UNIVERSAL JOINT

the most common type of universal joint used. Consists of a center cross, four bearing cups, each containing a set of needle roller bearings, grease seals and snap rings.

C-CLIP

part used to retain the axle shaft in a drive axle assembly

CLUTCH DISC

the part of a clutch that receives the driving motion from the flywheel and pressure plate assembly and transmits that motion to the transmission input shaft.

CLUTCH FACING

the friction material on a clutch disc.

CLUTCH FORK

also known as the release fork. The device which moves the throwout (release) bearing, activating the pressure plate.

CLUTCH PACK

in an automatic transmission, an assembled series of clutch friction discs and clutch plates that are alternately layered.

CLUTCH PRESSURE PLATE

the part of a clutch assembly that is used to hold the driven disc against the flywheel. The pressure plate is composed of a cover and coil springs, driving disc and release levers, or a diaphragm spring.

CLUTCH RELEASE BEARING

a sealed ball or roller bearing unit that rides on a sleeve over the transmission input shaft, and acts on the pressure plate to disengage the clutch disc when the clutch release mechanism is applied. Also called a throwout bearing.

CLUTCH THROWOUT BEARING

see 'clutch release bearing'.

CLUTCH

in a manual transmission, a device that allows the driver to engage and disengage the engine from the drivetrain; in an automatic transmission, a device capable of both holding and turning members of a planetary gearset; a device used to engage and disengage and A/C compressor.

CONSTANT MESH

in a transmission, where all gears are constantly in contact and turning with one another.

CONTINUOUSLY VARIABLE TRANSMISSION (CVT)

a continuously variable transmission is an automatic that can select any desired drive ratio within its operating range. Unlike a traditional three-, four-, or fivespeed automatic transmission the CVT is an "infinite speed" transmission, the CVT continually selects an optimum overall drive ratio between engine and drive wheels for all operating conditions, whether accelerating or cruising. Unlike conventional automatics, there are no perceptible shifts. During maximum acceleration, the drive ratio is adjusted to maintain peak engine horsepower. At a constant vehicle speed, the ratio is set to maintain an engine rpm which will support the required power. A CVT provides smooth, fast acceleration and high cruising efficiency with the convenience of an automatic transmission.

COUNTERGEAR

a set of different size gears incorporated in one casting, used in a manual transmission.

DIFFERENTIAL CARRIER

enclosure for the differential and ring and pinion gears. Can be removable or integral part of axle housing. Also called differential housing.

DIFFERENTIAL CASE

housing for the differential pinion gears and side gears. Mounting point for ring gear.

DIFFERENTIAL PINION GEARS

gears that are meshed with the differential side gears and rotate on the differential pinion shaft inside the differential case.

DIFFERENTIAL PINION SHAFT

a shaft mounted inside the differential case, provides support and pivot for the differential pinion gears.

DIFFERENTIAL SIDE GEARS

gears that are meshed with the pinion gears inside the differential case and splined to the axle shafts.

DIFFERENTIAL

gear assembly that transmits power from the driveshaft to the wheels; allows the outside wheel to turn faster than the inside when cornering.

DIRECT DRIVE

downward gear engagement in which the input shaft and output shaft are locked together; the gearing in a drivetrain in which one turn of the crankshaft equals one turn of the wheels.

DOUBLE CARDAN UNIVERSAL JOINT

two cardan universal joints connected by a yoke; also called a constant velocity (CV) joint.

DOUBLE OFFSET JOINT

a Rzeppa type plunger CV-joint used on the inboard side of the interconnecting shaft.

DOWEL

a peg or pin which fits into corresponding holes used for holding two parts together or to locate two parts in a set position.

DRIVE MEMBER

a gear that drives or provides power for other gears in a planetary gearset.

DRIVELINE ANGLE

see 'driveshaft angle'.

DRIVELINE

all of the parts connecting the engine to the drive axle.

DRIVESHAFT ANGLE.

the installation angle of the driveshaft off the true horizontal; also called driveline angle.

DRIVESHAFT

transfers power from the transmission to the differential on a rear-wheel drive vehicle. Consists of a hollow metal tube with universal joints at each end, each of which is attached to yokes at the transmission and differential.

DRIVETRAIN

all of the components that generate power and transfer it to the vehicle's wheels.

ELECTRONIC AUTOMATIC TRANSMISSION

an electronic automatic transmission utilizes an electronic control module to signal when to shift. The module also determines when to lock and unlock the torque converter. By controlling these functions electronically rather than mechanically, the transmission can be tuned for better driveability.

ENDPLAY

the amount of axial or end-to-end movement in a shaft due to clearance in the bearings; the regulated movement of a component, usually a shaft, during operation.

EXCESSIVE WEAR

in mechanical terms, wear of a component that exceeds designed limits; wear caused by overloading a part that is in an out-of-balance condition, resulting in lower-than-normal life expectancy of the part being subjected to the adverse operating condition.

EXTENSION HOUSING

aluminum or cast iron enclosure for the transmission output shaft and bearings, speedometer drive and driven gears. Provides support for driveshaft slip yoke.

FLANGE

a projecting rim or collar on a component used for holding it in place, giving it strength or guiding it into place or attaching it; a part mounted on the pinion gear that provides the mounting point for the rear universal joint of the driveshaft.

FLYWHEEL

a cast iron or steel wheel mounted to the end of the crankshaft; helps to smooth the engine's power delivery, the teeth around its circumference provide an engagement for the starter, and it provides the mounting points for the pressure plate and friction surface for the clutch disc.

FOUR WHEEL DRIVE (4WD)

system that supplies power to both the front and rear wheels of the vehicle when activated.

FREE PLAY

the measurable travel in a mechanical device between the time force is applied and work is accomplished; looseness in a linkage between the start of application and the actual movement of the device, such as the movement in the steering wheel before the wheels start to turn.

FREE TRAVEL

distance a clutch pedal moves before it begins to take up slack in the clutch linkage; essentially the same as free play, usually applied to shaft movement.

FREEWHEEL

a mechanical device that engages the driving member to impart motion to a driven member in one direction but not the other; in automotive terms, a device that permits the driveshaft to continue turning when its speed exceeds that of the crankshaft, thus allowing free coasting with the gear train engaged.

FRONT WHEEL DRIVE

the entire drivetrain is located at the front of and drives the front wheels of the vehicle.

FULL FLOATING AXLE

system where the weight of the vehicle is supported by the axle housing and the axle bearing is located outside of the axle housing; most often used on trucks.

FULLY SYNCHRONIZED

in a manual transmission, where gears are changed using synchronizers.

GEAR PITCH

number of teeth per given unit of pitch diameter. Gear pitch is determined by dividing the number of teeth by the pitch diameter of the gear.

GEAR RATIO

the number of revolutions a driving gear must turn to rotate the driven gear through one revolution. Numerical value determined by dividing the number of teeth on the driven gear by the number of teeth on the driving gear; the ratio between the number of teeth on meshing gears.

GEAR REDUCTION

when a smaller gear drives a larger gear, there is a speed reduction but an increase in torque.

GEAR

a toothed wheel, disc, etc. designed to mesh with another or with the thread of a worm; used to transfer or change motion.

GOVERNOR PRESSURE

the change in line pressure that takes place as a result of an increase in vehicle speed.

GOVERNOR

a device used on non-electronic automatic transmissions, which regulates the operation of the shift valves inside the valve body according to vehicle speed.

HELICAL GEAR

a gear in which the teeth are cut so as to form a spiral; gear with teeth that are cut at an angle or are spiral to the gear's axis of rotation.

HUNTING GEARSET

differential gearset where any one pinion gear tooth contacts all ring gear teeth.

HYPOID GEAR

bevel-cut gear in a system in which the driven gear is not in the same plane as the drive gear. A type of spiral, beveled ring and pinion gearset in a differential. Hypoid gears mesh below the ring gear centerline.

INPUT SHAFT

the shaft that is splined to the clutch disc and transfers power from the engine into the transmission; the shaft to which torque is applied, usually carrying the drive gear or gears.

INSERT SPRING.

exerts pressure on the inserts in a synchronizer assembly.

INSERT

a part of the synchronizer assembly that fits between the hub and sleeve, also called key or plate. The insert spring pushes the inserts into the sleeve, helping to center the sleeve on the hub.

LIMITED SLIP DIFFERENTIAL

a type of differential that uses clutches to supply a major portion of the drive torque to the wheel that has better traction when one wheel is slipping,

LINE PRESSURE

in an automatic transmission, the hydraulic pressure of the fluid after it leaves the pump and is regulated by the pressure regulator.

LIVE AXLE

an axle on which the wheels are firmly affixed, with the axle driving the wheels.

MAINLINE PRESSURE

in an automatic transmission, pressure that is regulated in the hydraulic system.

MESH

to fit closely together or interlock, as the fit of gear teeth.

NEEDLE BEARING

an anti-friction device that consists of a number (usually a large number) of thin rollers riding within races.

NEUTRAL START SWITCH

a switch that prevents starter engagement if the transmission is in another gear besides Park or Neutral.

NONHUNTING GEARSET

differential gearset in which one drive pinion gear tooth contacts only three ring gear teeth after several rotations.

OIL COOLER

device used to remove heat from the engine or transmission oil. There are oil-to-air coolers and oil coolers that are incorporated into the vehicle's cooling system.

ORIGINAL EQUIPMENT MANUFACTURER (OEM)

the original manufacturer of a vehicle or engine.

OUTER BEARING RACE

outer part of a ball or roller bearing that provides a surface for the balls or rollers to rotate. Can be integral with the bearing or a separate part.

OUT-OF-ROUND

when a previously round hole or bore has different diameters when measured at different points due to wear or distortion.

OUTPUT SHAFT

the shaft that delivers the power that has come through the transmission or transaxle.

OVERDRIVE

a gear assembly that outputs more shaft revolutions than were input.

OVERRUNNING CLUTCH

a clutch that locks in one direction and overruns or freewheels in the other.

PINION GEAR

the smaller, drive gear of the ring and pinion gearset; one of the gears inside the differential that rotates on the differential pinion shaft; rotates around the sun gear in a planetary gearset.

PINION

the smaller of two meshing gears.

PLANETARY CARRIER

houses the pinion gears in a planetary gearset.

PLANETARY GEARSET

a gear system consisting of three primary components: a sun gear, a planetary pinion carrier and a ring or internal gear.

POWERTRAIN CONTROL MODULE (PCM)

on vehicles with computer control systems, the main computer that determines engine operation based on sensor inputs and by using its actuator outputs. The PCM may also control transmission operation.

PRESSURE PLATE

the driving member of the clutch assembly. Coil springs or a diaphragm spring in the pressure plate exert pressure on the clutch disc, holding it against the flywheel.

REAR WHEEL DRIVE

system where the driveline drives the rear wheels of the vehicle. Most often the engine is located in the front of the vehicle and a transmission and drive shaft connect to a drive axle, however there are also systems where the entire drive line is located toward the rear of the vehicle.

RELEASE BEARING

see 'clutch release bearing'.

REVERSE IDLER GEAR

a gear used to reverse the direction of power in a transmission.

RING GEAR

the larger, driven gear of the ring and pinion gearset; the largest member in a planetary gearset, also known as the internal gear or annulus. The internal teeth of the gear mesh with and rotate on the planetary pinions.

ROTARY FLOW

torque converter oil flow associated with the coupling stage of operation.

SEAL

a part, usually made of rubber or plastic, installed around a moving part or shaft to prevent leaks.

SEMI-FLOATING AXLE

system where the axle bearing is located inside the axle housing and the weight of the vehicle is supported by the axle.

SHIFT FORK

a device in a manual transmission that moves the synchronizer assembly sleeve, in response to movement from the shift linkage.

SHIFT RAILS

the parts of transmission shift linkage that transfer motion from the driver-controlled gear shift lever to the shift forks.

SHIFTER

the lever operated by the driver to shift the transmission. The shifter is attached directly to internal linkage in the transmission or it is mounted on the outside of the transmission or on the frame or

vehicle floor, and connected to the transmission or trans axle by external linkage rods or cables.

SLAVE CYLINDER

a device that is connected to the release bearing in a hydraulic clutch system. When the clutch pedal is depressed, hydraulic fluid flows from the master cylinder through the hydraulic fluid line to the slave cylinder. Pressure in the system causes the slave cylinder to act on the release bearing, disengaging the clutch

SLIP YOKE

a driveline component that is splined to the transmission output shaft and connected to the driveshaft front U-joint. Allows in and out movement on the transmission extension housing in response to rear suspension movement.

SLIP

condition caused when a driving part rotates faster than a driven part.

SPLINES

grooves cut into the outside or inside surface of a component to enable it to fit with another component having corresponding grooves. Commonly used to keep a component secured on a rotating shaft.

SPRAG CLUTCH

a type of overrunning clutch.

SUMP

the reservoir that holds the oil for the pump.

SYNCHRONIZER

a type of clutch assembly used in a manual transmission to shift gears. Consists of a hub splined to the main shaft, inserts (keys) and insert springs, outer sleeve and blocking rings. There are grooves machined into the sleeves to capture the shift forks, which transfer the motion from the gearshift linkage. The sleeve moves along the splined inner hub in response to the shift fork, forcing the blocking ring against the gear cone and then, when the gear is at the same speed, slides over the blocking ring and gear engagement teeth, locking the gear to the synchronizer hub and shaft.

THROWOUT BEARING

see 'clutch release bearing'.

THRUST BEARING

a bearing that separates rotating parts from each other and non-rotating parts, and absorb thrust loads; a bearing with side surfaces that controls the fore and aft movement of a shaft.

TORQUE CONVERTER CLUTCH

a device located inside the torque converter that mechanically links the engine and transmission together.

TORQUE CONVERTER

a fluid coupling device used to transfer engine torque from the crankshaft to the transmission.

TORQUE STEER

the tendency of many front -wheel-drive vehicles with half-shafts of unequal length, to turn somewhat from the desired direction when accelerating, especially in a curve, or when

decelerating in a curve.

TRANSFER CASE

attached to or connected to the transmission in a four-wheel drive vehicle. Transfers power to both front and rear axles.

TRANSMISSION CONTROL MODULE (TCM)

the computer that controls the transmission.

TRANSMISSION

transfers the engine's power to the driveshaft and the rear wheels. Contains a series of gears that provide torque multiplication, so the vehicle can be moved from a standstill and also cruise at highway speeds at lower engine rpms.

TRANSVERSE

perpendicular or at a right angle to a front-to-back centerline.

TRIPOD JOINT

a type of CV-joint consisting of a spider, which is splined to the interconnecting shaft of the halfshaft, three rollers that turn on needle roller bearings located between the spider and rollers, a housing, or yoke, that is part of the stub shaft, and a boot. Used on the inboard side of the halfshaft.

UNIVERSAL JOINT (U-JOINT)

a joint that allows the driveshaft to transmit torque at different angles as the suspension moves up and down.

VACUUM MODULATOR

a device used to vary line pressure according to engine load in an automatic transmission.

VALVE BODY

in an automatic transmission, the housing that contains most of the valves used for transmission operation.
