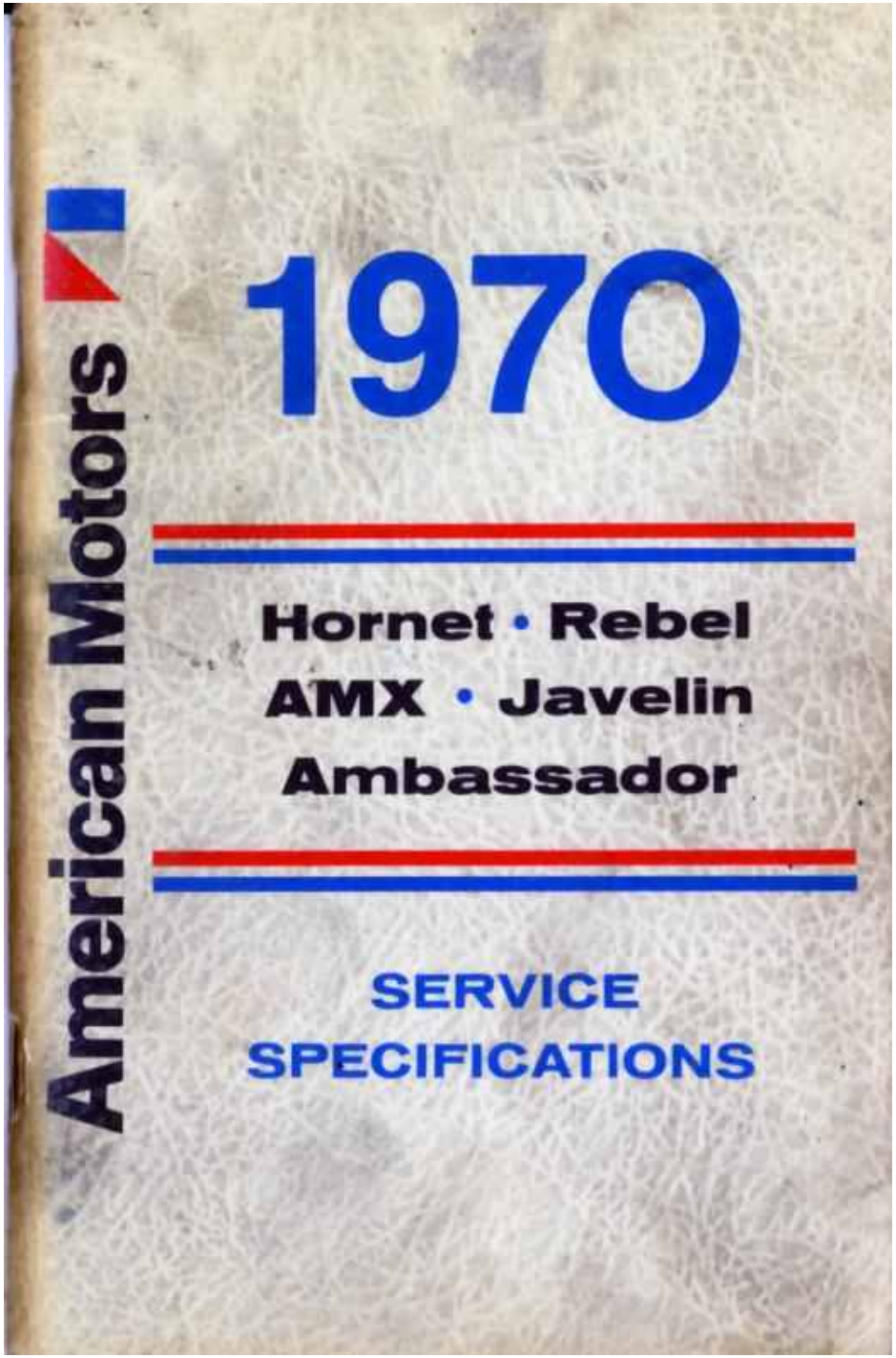


American Motors

HORNET

AMX

JAVELIN

REBEL

AMBASSADOR

1970
SERVICE SPECIFICATIONS

AMERICAN MOTORS CORPORATION
TECHNICAL SERVICE

SA-69-2004, 1st Printing, 8-69 Lithographed in U.S.A.

FOREWORD

This handbook contains tune-up, service specifications and other technical data for the 1970 Hornet AMX, Javelin, Rebel and Ambassador Series.

NOTE: Specifications where applicable are designated in relation to the type of engine equipment and is signified by cubic inch displacement. Specifications in other cases are designated by Series.

The specifications and adjustments contained in this manual were in effect at the time of the publication. American Motors reserves the right to discontinue models, change specifications or design, without notice or incurring obligation.

The brand names mentioned in this manual are to be construed as and/or their equivalent. They are not intended as advertising material but as specific type.

1970 AMERICAN MOTORS SERVICE SPECIFICATIONS

BODY IDENTIFICATION AND FEDERAL SAFETY CERTIFICATION

A plastic covered motor vehicle certification sticker, which lists the month and year built, (VIN) vehicle identification number, and the safety compliance statement is attached with an adhesive, adjacent to the unit body and Federal Safety Standards Plate. The plate is riveted to the left front door adjacent to the door latch.

This plate includes the model, body, trim, paint code, and car built sequence numbers.

UNIT BODY NUMBER PLATE

Milwaukee built bodies start with Body Number 000001.

Kenosha Main Body Plant built bodies start with Body Number 000001.

Kenosha Lake Front Plant built bodies start with Body Number R-000001.

Brampton built bodies start with Body Number 700001.

The model number identifies the body style. This number, when followed by numbers 2, 5 or 7 designates the different groups of optional appointments built into the car as original equipment.

The numbers on the plate must be listed when any references are made to the body or when ordering parts and material for the body.

MODEL NUMBERS

"HORNET" (01 Series)

Model	Style
7005-0	4-Door Sedan
7005-7	4-Door Sedan "SST"
7006-0	2-Door Sedan
7006-7	2-Door Sedan "SST"

"REBEL" (10 Series)

Model	Style
7015-0	4-Door Sedan
7015-7	4-Door Sedan "SST"
7018-0	4-Door Station Wagon
7018-7	4-Door Station Wagon "SST"
7019-0	2-Door Hardtop
7019-7	2-Door Hardtop "SST"

"AMX" (30 Series)

Model	Style
7039-7	2-Door Sports Coupe

"JAVELIN" (70 Series)

Model	Style
7079-5	2-Door Hardtop
7079-7	2-Door Hardtop "SST"

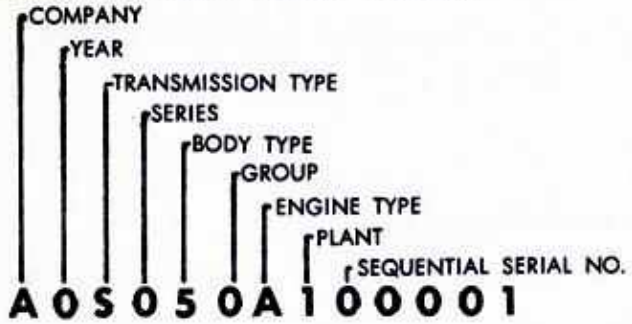
"AMBASSADOR" (80 Series)

Model	Style
7085-2	4-Door Sedan
7085-5	4-Door Sedan "DPL"
7085-7	4-Door Sedan "SST"
7088-5	4-Door Station Wagon "DPL"
7088-7	4-Door Station Wagon "SST"
7089-5	2-Door Hardtop "DPL"
7089-7	2-Door Hardtop "SST"

VEHICLE IDENTIFICATION

A thirteen (13) digit Vehicle Identification Number (VIN) is stamped on a metal plate which is riveted into a depression at the upper left corner of the instrument panel and is also printed on a non-removable label affixed to the left front door adjacent to the door latch.

The Vehicle Identification Number is decoded as follows:



Vehicle Identification Plate

The vehicle identification number is decoded as follows:

First Digit—"A" for American Motors Corporation.

Second Digit—Year—"0" for 1970

Third Digit—Transmission Type:

S—Standard Column Shift 3-Speed and 3-Speed Floor Shift
A—Automatic Column Shift 3-Speed
C—Shift Command—Console Mounted
M—4-Speed Floor Shift Floor Mounted

Fourth Digit—Series

0—Hornet
1—Rebel
3—AMX
7—Javelin
8—Ambassador

Fifth Digit—Body
5—4-Door Sedan
6—2-Door Sedan
8—4-Door Station Wagon
9—2-Door Hardtop

Sixth Digit—Group
0—Basic—Hornet, Rebel
2—Basic—Ambassador
5—Javelin, DPL
7—SST, AMX

Seventh Digit—Engine
A—199 O.H.V. Six, 1V
E—232 O.H.V. Six, 1V
G—232 O.H.V. Six, 2V
H—304 V-8, 2V
N—360 V-8, 2V
P—360 V-8, 4V
X—390 V-8, 4V

Eighth Through Thirteenth Digit—Sequential Serial Number:
100001 through 700000—Kenosha
700001 through 1000000—Brampton

1970 MODEL AND BODY STYLES

"Hornet" 7001 Series

Model	Style
7005	4-Door Sedan
7005-7	4-Door Sedan "SST"
7006	2-Door Sedan
7006-7	2-Door Sedan "SST"

"Rebel" 7010 Series

Model	Style
7015	4-Door Sedan
7015-7	4-Door Sedan "SST"
7018	4-Door Station Wagon
7018-7	4-Door Station Wagon "SST"
7019	2-Door Hardtop
7019-7	2-Door Hardtop "SST"

"AMX" 7030 Series

Model	Style
7039-7	2-Door Sports Coupe

"Javelin" 7070 Series

Model	Style
7079-5	2-Door Hardtop
7079-7	2-Door Hardtop "SST"

"Ambassador" 7080 Series

Model	Style
7085-2	4-Door Sedan
7085-5	4-Door Sedan "DPL"
7085-7	4-Door Sedan "SST"
7088-5	4-Door Station Wagon "DPL"
7088-7	4-Door Station Wagon "SST"
7089-5	2-Door Hardtop "DPL"
7089-7	2-Door Hardtop "SST"

TREAD WIDTH AND WHEEL BASE

Model	Wheel Base	Front Tread	Rear Tread
7001 Six Cyl.	108"	57.46"	57.00"
7001 V-8	108"	57.46"	57.00"
7010 Six Cyl.	114"	59.94"	60.00"
7010 V-8	114"	59.72"	60.00"
7030 V-8	97"	59.08"	56.60"
7070 Six Cyl.	109"	59.30"	57.00"
7070 V-8	109"	59.08"	56.60"
7080 Six Cyl.	122"	59.94"	60.00"
7080 V-8	122"	59.72"	60.00"

OVERALL LENGTH

7001—Hornet	179.26"
7010—Station Wagon	198.00"
7010—Two Door Hardtop and Four Door Sedan	199.00"
7030—AMX	179.04"
7070—Javelin	191.04"
7080—Station Wagon	207.00"
7080—Two Door Hardtop and Four Door Sedan	208.00"

EXTERIOR DIMENSIONS

	7001	7010	7030	7070	7080
Width	71.08"	77.24"	71.57"	71.89"	77.24"
Height, Four Door Sed.	52.58"	55.04"	——	——	54.24"
Two Door Sed.	52.58"	——	——	——	——
Hardtops	——	54.45"	51.20"	51.56"	54.66"
Station Wagon	——	56.11"	——	——	56.08"
Front Overhang	33.25"	31.90"	41.52"	41.52"	32.90"
Rear Overhang	38.01"	53.10"	40.52"	40.52"	53.10"
Station Wagon	——	52.10"	——	——	52.10"

INTERIOR DIMENSIONS

Hornet

	2-Door Sedan	4-Door Sedan
Headroom, Front	38.00"	38.00"
Headroom, Rear	37.00"	37.00"
Legroom, Front	41.70"	41.70"
Legroom, Rear	36.75"	36.75"
Shoulder Room, Front	55.10"	55.10"
Shoulder Room, Rear	54.40"	54.40"
Hiproom, Front	55.00"	55.00"
Hiproom, Rear	54.20"	54.20"

Rebel

	4-Door Sedan	4-Door Wagon	2-Door Hardtop
Headroom, Front	39.50"	39.80"	38.70"
Headroom, Rear	37.40"	38.60"	36.50"
Legroom, Front	42.00"	42.00"	42.00"
Legroom, Rear	38.60"	38.60"	35.50"
Shoulder Room, Front	60.00"	60.00"	60.00"
Shoulder Room, Rear	60.00"	60.00"	59.00"
Hiproom, Front	60.30"	60.30"	60.30"
Hiproom, Rear	60.40"	60.40"	59.50"

	AMX 2-Door Hardtop	Javelin 2-Door Hardtop
Headroom, Front	37.20"	37.50"
Headroom, Rear	——	36.00"
Legroom, Front	42.70"	42.70"
Legroom, Rear	——	31.50"
Shoulder Room, Front	55.00"	55.00"
Shoulder Room, Rear	——	53.20"
Hiproom, Front	57.60"	57.60"
Hiproom, Rear	——	56.38"

Ambassador

	4-Door Sedan	4-Door Wagon	2-Door Hardtop
Headroom, Front	39.50"	39.80"	38.70"
Headroom, Rear	37.40"	38.60"	36.50"
Legroom, Front	42.00"	42.00"	42.00"
Legroom, Rear	38.60"	38.60"	35.50"
Shoulder Room, Front	60.00"	60.00"	60.00"
Shoulder Room, Rear	60.00"	60.00"	59.00"
Hiproom, Front	60.30"	60.30"	60.30"
Hiproom, Rear	60.40"	60.40"	59.50"

STATION WAGON CARGO DIMENSIONS

	Rebel Ambassador
Tailgate Opening Width at Floor	53.66"
Tailgate Opening Width at Beltline	52.24"
Tailgate Opening Height	27.84"
Tailgate-to-Ground Height	22.46"
Cargo Length at Floor to Front Seat	92.63"
Cargo Length at Beltline to Front Seat	82.73"
Cargo Width Between Wheelhouse	45.08"
Cargo Length at Floor to Rear Seat	56.53"
Cargo Length at Beltline to Rear Seat	46.74"

TUNE-UP SPECIFICATIONS

	6 Cylinder	All V-8
Spark Plugs	N-14Y	N-12Y
Spark Plug Gap	.033"-.037"	.033"-.037"
Distributor Rotation	CW @ Rotor End	CW @ Rotor End
Distributor Point Gap	.016"	.016"
Distributor Cam Angle (Dwell)	31°-34°	29°-31°
Breaker Arm Tension	17-21 Oz.	17-21 Oz.
Condenser Capacity	.18-.23 Mfd.	.18-.23 Mfd.
Cylinder Head Torque Ft. Lbs.	80-85	105-115
Fuel Pump Pressure @ 500 RPM	4 to 5½ PSI	5 to 6½ PSI
Booster Pump Vacuum @ 1000 RPM (Vacuum Lines Off)	14"-19"	14"-19"
Cylinder Compression Rating	145 PSI	145 PSI
Valve Adjustment	Hydraulic Lifters	Hydraulic Lifters

IGNITION TIMING AND ENGINE IDLE RPM

ENGINE CID	TRANS TYPE	VACUUM UNIT			Final Idle Speed (RPM)	
		Hose/s Disconnected 500 RPM	Retard Hose Connected 500 RPM or Less	Advance Hose Connected 2000 RPM#	Auto*	Manual
199-232 (Except 01-232 Auto. Trans.)	All	3° BTDC	3½°-6½° ATDC	29°-37°	550	600
232 (01 Auto. Trans. Only)	Auto	3° BTDC	—	38°-42°	550	
304-360 2V (Except 304 Auto Trans.)	All	5° BTDC	4°-6° ATDC	28½°-35½°	600	650
304-2V	Auto	5° BTDC	4°-6° ATDC	12°-16°	600	
360-4V	All	5° BTDC	4°-6° ATDC	30½°-37½°	600	650
390-4V	All	TDC	—	41°-47°	600	650

#Checked only with adjustable timing light. Adjust to ATDC spec. if equipped with dual diaphragm unit and TDC with single diaphragm unit.

*Set Parking Brake Firmly. Do Not Accelerate Engine.

ENGINE IDENTIFICATION

Code	CID	Carb.	Comp. Ratio	Bore
A	199	1V	8.5:1	3.750"
E	232	1V	8.5:1	3.750"
G	232	2V	8.5:1	3.750"
H	304	2V	9.0:1	3.750"
N	360	2V	9.0:1	4.080"
P	360	4V	10.0:1	4.080"
X	390	4V	10.0:1	4.165"

GENERAL

ENGINE MODELS — **CID**

Torque Command Sixes 199, 232
Typhoon V-8 ..... 304, 360
AMX V-8 390

TYPE

199-232 ..... In-line, Six, O.H.V.
304-360-390 .... 90°, V-8, O.H.V.

BORE AND STROKE

199 ..... 3.750" × 3.000"
232 ..... 3.750" × 3.500"
304 ..... 3.750" × 3.440"
360 ..... 4.080" × 3.440"
390 ..... 4.165" × 3.574"

FIRING ORDER

Sixes 1-5-3-6-2-4
V-8 1-8-4-3-6-5-7-2

COMPRESSION RATIO

199-232 All 8.5:1
304-360 2V 9.0:1
360 4V 10.0:1
390 4V 10.0:1

TAXABLE HORSEPOWER

199-232 ..... 33.75
304 ..... 45.00
360 ..... 53.27
390 ..... 55.51

MAXIMUM BRAKE HORSEPOWER*

Bhp @ Eng. R.P.M.

199 ..... 128 @ 4400
232, 1 V Carb ..... 145 @ 4300
232, 2 V Carb ..... 155 @ 4400
304, 2 V Carb ..... 210 @ 4400
360, 2 V Carb ..... 245 @ 4400
360, 4 V Carb .... 290 @ 4800
390, 4 V Carb .... 325 @ 5000

*Max. bhp and max. torque corrected to 60°F. and 29.92" Hg. atmospheric pressure.

MAXIMUM TORQUE*

(Lbs. Ft. @ R.P.M.)

199 ..... 182 @ 1600
232, 1 V Carb .... 215 @ 1600
232, 2 V Carb .... 222 @ 1600
304, 2 V Carb ..... 305 @ 2800
360, 2 V Carb ..... 365 @ 2400
360, 4 V Carb ..... 395 @ 3200
390, 4 V Carb ..... 435 @ 3200

*Max. bhp and max. torque corrected to 60°F. and 29.92" Hg. atmospheric pressure.

COMPRESSION PRESSURE

(Cranking Speed at Sea Level) ..... 145 P.S.I.

RECOMMENDED FUEL

199-232-304-360 2 V Carb ..... Regular
360-390 4 V Carb ..... Premium

ENGINE IDLE RPM

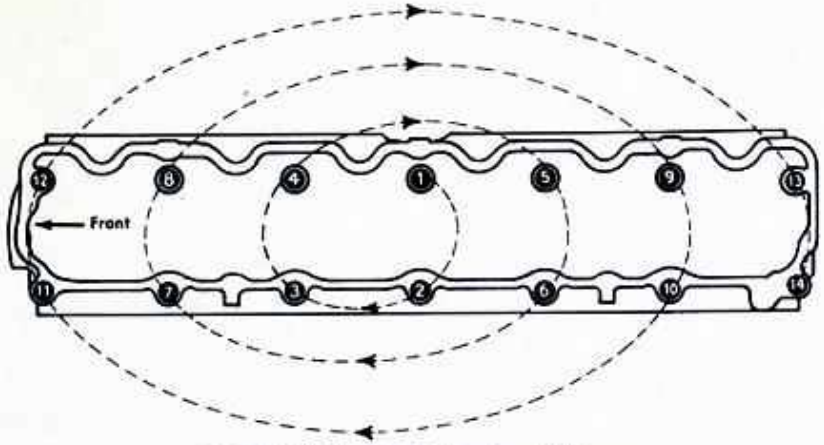
MANUAL TRANSMISSIONS
199-232 600
304-360-390 650
AUTOMATIC TRANSMISSION
199-232 550
304-360-390 600

All idle speed adjustments are made with A/C "OFF"

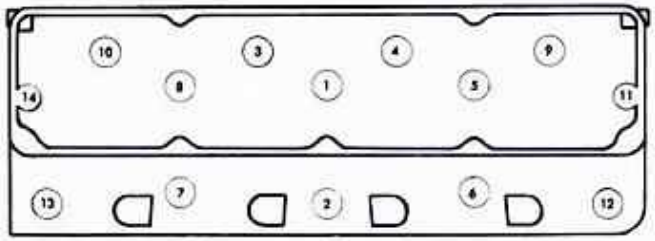
OIL PRESSURE

All Engines ..... 75 P.S.I. Max.

CYLINDER HEAD TORQUE TIGHTENING SEQUENCE



199-232 O.H.V.—80-85 Foot Pounds Torque



304-360-390 V-8—105-115 Foot Pounds Torque

CYLINDER HEAD FLATNESS

.006" Max., .002" in 6", .001" in 1"

CYLINDER BLOCK FLATNESS

.006" Max., .002" in 6", .001" in 1"

VALVE ARRANGEMENT

Front to Rear
199-232 ..... EI-IE-EI-IE-EI-IE
304-360-390 (1 Bank) .. EI-IE-EI-IE

OPERATING TAPPET CLEARANCE

Hydraulic Lifters ..... Zero Lash

VALVE TIMING

	199-232
Intake—	
Opens (°B.T.D.C.)	12°-30'
Closes (°A.B.D.C.)	51°-30'
Duration—deg.	244°
Exhaust—	
Opens (°B.B.D.C.)	52°-30'
Closes (°A.T.D.C.)	10°-30'
Duration—deg.	244°
Valve Opening Overlap	23°

	304-360
Intake—	
Opens (°B.T.D.C.)	18°-30'
Closes (°A.B.D.C.)	67°-30'
Duration—deg.	266°
Exhaust—	
Opens (°B.B.D.C.)	60°-30'
Closes (°A.T.D.C.)	25°-30'
Duration—deg.	266°
Valve Opening Overlap	44°

	390
Intake—	
Opens (°B.T.D.C.)	18°
Closes (°A.B.D.C.)	68°
Duration—deg.	266°
Exhaust—	
Opens (°B.B.D.C.)	66°
Closes (°A.T.D.C.)	20°
Duration—deg.	266°
Valve Opening Overlap	44°

HIGH PERFORMANCE CAM

Intake—	
Opens (°B.T.D.C.)	46°
Closes (°A.B.D.C.)	76°
Duration—deg.	302°
Exhaust—	
Opens (°B.B.D.C.)	70°
Closes (°A.T.D.C.)	52°
Duration—deg.	302°
Valve Opening Overlap	98°

CAM LOBE LIFT

Intake and Exhaust

199-232	.254"
304-360	.265"
390	.287"

ROCKER ARM RATIO

199-232	1.5:1
304-360-390	1.4:1

VALVE STEM STANDARD DIAMETER

All Engines

Intake and Exhaust, .3715"-.3725"

Available for Service in oversizes of .003", .015", and .030".

VALVE MATERIAL

Intake	Silichrome #1 or XB Aluminized
Exhaust	SAE 21-4N

VALVE HEAD DIAMETER

199-232-304	
Intake	1.787"
Exhaust	1.406"
360-390	
Intake	2.025"
Exhaust	1.625"

VALVE GUIDE TYPE ..... Integral

VALVE GUIDE I.D.—

Intake and Exhaust

All Engines ..... .3735"-.3745"

VALVE STEM TO GUIDE CLEARANCE

Intake and Exhaust

All Engines ..... .001"-.003"

VALVE LENGTH

Intake and Exhaust

All Engines ... 4.7895"-4.8045"

VALVE FACE ANGLE

199-232	
Intake	29°
Exhaust	44°
304-360-390	
Intake	29°
Exhaust	44-1/2°

VALVE SEAT ANGLE

All Engines

Intake	30°
Exhaust	45°

VALVE SEAT RUN-OUT

All Engines ..... Max. .0025"

VALVE SEAT WIDTH

199-232

Intake	.050"-.075"
Exhaust	.040"-.060"
304	
Intake	.055"-.065"
Exhaust	.040"-.060"
360-390	
Intake	.040"-.060"
Exhaust	.040"-.060"

VALVE SPRING TENSION

199-232		
Closed	95-105 Lbs.	1-13/16"
Open	188-202 Lbs.	1-7/16"
Free Length		2-17/64"
304-360		
Closed	85-93 Lbs.	1-13/16"
Open	193-207 Lbs.	1-25/64"
Free Length	Approx.	2-15/64"
390		
Closed	90-98 Lbs.	1-13/16"
Open	183-195 Lbs.	1-23-64"

VALVE SPRING ASSEMBLED HEIGHT LOWER SEAT TO RETAINER

All Engines ..... 1-13/16"

VALVE TAPPET DIAMETER

All Engines ..... .904"-.9045"

VALVE TAPPET TO TAPPET BORE CLEARANCE

All Engines ..... .0005"-.002"

HYDRAULIC LIFTER LEAK DOWN RATE

(KM Oil J-5268, 50 Lb. Load—Travel of .125")

All Engines ..... 20-110 Seconds

ROCKER ARM SHAFT O.D.

199-232 ..... .8575"-.8585"

ROCKER ARM TO SHAFT CLEARANCE

199-232 ..... .003"-.005"

TIMING CHAIN DEFLECTION

All Engines ..... Max. 1/2"

CAMSHAFT END PLAY

Zero—Engine Operating

CAMSHAFT BEARING OIL CLEARANCE

All Engines ..... .001"-.003"

CRANKSHAFT MAIN BEARING JOURNAL STANDARD DIAMETER

199-232	2.4986"-2.5001"
304-360-390	2.7474"-2.7489"
Rear Main	2.7464"-2.7479"

CRANKSHAFT MAIN BEARING CLEARANCE

All Engines	.001"-.002"
304-360-390	
Rear Main Only	.002"-.003"

CRANKSHAFT END PLAY

199-232	.0015"-.007"
304-360-390	.008" Max.

CONNECTING ROD JOURNAL DIAMETER

199-232-304-360	2.0934"-2.0955"
390	2.2492"-2.2471"

CONNECTING ROD AND MAIN BEARING JOURNAL— OUT OF ROUND

All Engines ..... Max. .0004"

CONNECTING ROD AND MAIN BEARING JOURNAL TAPER

All Engines ..... Max. .0003"

CONNECTING ROD BEARING CLEARANCE

All Engines ..... .001"-.002"

PISTON TO BORE CLEARANCE

199-232	.0005"-.0013"
304	.0010"-.0018"
360	.0012"-.0020"
390	.0010"-.0018"

PISTON PIN TO CONNECTING ROD

Press Fit ..... 2,000 Lbs.

PISTON PIN TO PISTON CLEARANCE

(All Pieces Room Temp.)
All Engines ..... .0003"-.0005"

PISTON RING WIDTH

All Engines—Top and Second Compression ..... 5/64"

PISTON RING SIDE CLEARANCE

199-232 1 and 2 .0015"-.0035"
3 .000"-.005"
304-360-390 1 and 2 .002"-.004"
3 .000"-.005"

PISTON RING GAP CLEARANCE

All Engines 1 and 2 .010"-.020"
3 .015"-.055" (Rail Gaps)

CYLINDER BORE DIAMETER

199-232 ..... 3.7497"-3.7529"
304 ..... 3.7502"-3.7534"
360 ..... 4.0799"-4.0831"
390 ..... 4.165"-4.167"

CYLINDER BORE—OUT OF ROUND

All Engines ..... Max. .002"

CYLINDER BORE TAPER

All Engines ..... Max. .005"

OIL SYSTEM

Oil Pump ..... Gear Type
Normal Oil Pressure
All Engines 10 P.S.I. @ 600 RPM
Oil Pressure Relief ... 75 P.S.I.
199-232
Gear to Body Clearance .... .0005"-.0025"
Gear End Clearance ..... .000"-.004" (Gears Above Body)
304-360-390
Gear to Body Clearance ..... .002"-.004"
Gear End Clearance .... .0025"-.0065" (Gears Above Body)

TORQUE LIMITS—FOOT POUNDS

199-232
Camshaft Sprocket Screw 45-55
Carburetor Hold Down Nuts 12-15
Connecting Rod Bolt Nuts 26-30
Crankshaft Main Bearing Cap Screws 75-85
Cylinder Head Cover Screws ..... 45-55 (In. Lbs.)
Cylinder Head Cap Screws 80-85
Distributor Bracket Retaining Screw 10-15
Intake and Exhaust Manifold Bolts and Stud Nuts .. 20-25
Flywheel to Crankshaft Screws 100-110
Fuel Pump Screws 15-17
Engine Rear Support Cushion to Case Cap Screws .. 35-45
Oil Pump Cover Screws ... 8-12
Oil Pump Screw (Short) ... 8-12
Oil Pump Screw (Long) .. 15-18
Oil Pan Screws
1/4"-20 5-8
5/16"-18 10-12
Front Support, Cushion to Bracket Screws 30-35
Spark Plug 25-30
Thermostat Housing Stud Nuts 10-15
Timing Case Cover Screws 4-6
Vibration Damper Retaining Screw 50-60
Water Pump 10-15
Rocker Arm Assembly Screws 20-23
Drive Plate to Converter 30-35
Drive Plate to Crankshaft 100-110
Clutch Housing to Block Screws (Top) 25-28
Clutch Housing to Block Screws (Bottom) 40-45
All torque values are given in Foot Pounds unless otherwise specified.

304-360-390
Camshaft Gear Screw ... 25-35
Carburetor Hold Down Nuts 12-15
Connecting Rod Bolt Nuts 26-30
(390 Only) 35-40
Crankshaft Main Bearing Cap Screws 95-105
Cylinder Head Cover Screws ..... 20-30 In. Lbs.
Cylinder Head Cap Screws 105-115
Distributor Bracket Retaining Screws 10-15
Engine Rear Support Cushion to Case Cap Screws 30-35
Engine Front Support Cushion to Crossmember 30-45
Exhaust Manifold Bolts ... 30-35
Air Injection Tube to Manifold 35-40
Flywheel or Flex Plate to Crankshaft Screw ... 100-110
Front Support Cushion to Bracket Screw 30-35
Fuel Pump Screw 15-17
Intake Manifold Screw ... 40-45
Oil Pump Cover Screw ..... 48-60 In. Lbs.
Oil Pan Screw ....1/4"-20 5-8
5/16"-18 10-12
Rocker Arm Studs to Cyl. Head 65-70
Rocker Arm Retaining Stud Nut 20-25
Spark Plug 25-30
Thermostat Housing Screws 10-15
Timing Chain Cover Screws 20-30
Vibration Damper Retaining Screw 50-60
Water Pump to Timing Case Cover ..... 45-50 In. Lbs.
All torque values are given in Foot Pounds unless otherwise specified.

COOLING

COOLANT CAPACITY INCLUDING HEATER

199 ..... 10.5 Qts.
232 ..... 10.5 Qts.
304 ..... 14 Qts.
360-390 ..... 13 Qts.

RADIATOR CAP PRESSURE ..... 14 P.S.I.

FAN BELT TENSION

Use Fan Belt Strand Tension Gauge J-7316
New Belt 125-145
Pre-delivery or Belt With Previous Service 90-110

THERMOSTAT

199-232
Starts to Open ..... 205°F.±2
Fully Open ..... 228°F.
304-360-390
Starts to Open ..... 195°F.±2
Fully Open ..... 218°F.

TORQUE LIMITS—FOOT POUNDS

Fan Blade to Hub Screw 15-20
Timing Chain Cover To Engine—304-360-390 . 20-30
Thermostat Housing Screw 10-15
Water Pump Mounting Screw—
304-360-390 ..... 45-50 In. Lbs.
199-232 10-15

BATTERY

	199-232-304	360-390	Optional
MAKE	←	"Clear Power"	→
RATING	50 Amp. Hours	60 Amp. Hours	70 Amp. Hours
TOTAL NO. OF PLATES	54	66	66

BATTERY TESTS

Specific Gravity Variation
If specific gravity is above 1.235—more than 50 points variation between cells—unserviceable battery

Battery Load Test
3 Times the Ampere Rating of Battery—150 Amperes for 50 Amp. Hr.
180 Amperes for 60 Amp. Hr.
210 Amperes for 70 Amp. Hr.

Voltmeter ..... 9.6 Volts @ 70° Minimum Battery Load Test
Starter Motor used as Load Tester ..... 9.0 Volts
8.4 Volts (Amb. temp. below 40°F.)

Battery Cable Voltage Drops
Positive Cable ..... .2 Volt
Negative Cable ..... .2 Volt
Relay to Starter ..... .2 Volt

ALTERNATOR

Make	Motorola	American Motors	*Motorola
Rotation	←	CW @ drive end	→
Rated Current Output	35 @ 15 Volts	35 @ 14.2 Volts	55 @ 15 Volts
Field Current Amp.	2.0-2.6	2.4-2.5 @ 10 Volts	1.8-2.4

*Std. All 80 Series
Std. All Series With A/C or "Command Air" Ventilation

VOLTAGE REGULATOR

Make	Motorola	American Motors
Type	Solid State	Solid State
Adjustment	None	None

Minimum to Maximum Voltage control at various Ambient Temperatures—10 Ampere Load.

0°	14.65-15.4	80°	13.75-14.2
20°	14.4 -15.0	100°	13.6 -14.05
40°	14.2 -14.7	120°	13.45-13.95
60°	13.95-14.4	140°	13.3 -13.85
		160°	13.1-13.75

ROTOR FIELD CURRENT DRAW (ALTERNATOR)

With Fully Charged Battery, 12.6±.2 Volts
35 Amp. Motorola 2.0-2.6
35 Amp. American Motors @ 10 V. 2.4-2.5
55 Amp. Motorola 1.8-2.4

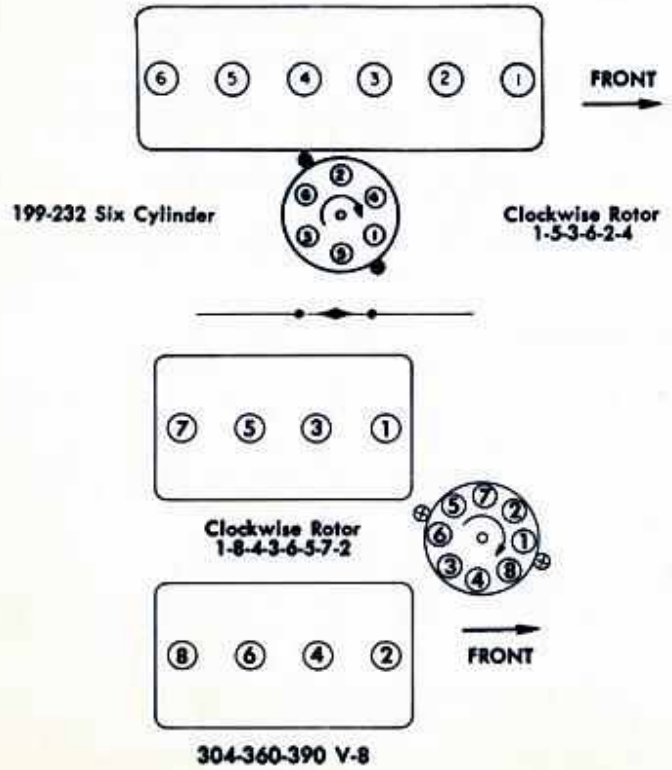
DRIVE BELT TENSION

Use Fan Belt Strand Tension Gauge J-7316
Pre-Delivery or Belt with Previous Service ..... 90-110 Lbs.
New Belt ..... 125-145 Lbs.

STARTER MOTORS

Brush Spring Tension ..... 40 Oz.
Free Speed
Volts 12.0
Amperes 65
RPM ..... 9250 Max.

Lock Test Maximum
Amperes 500
Volts 4.5
Brush Length ..... 0.5"
Wear Limit ..... 0.25"



DISTRIBUTOR WIRING SEQUENCE AND FIRING ORDER

DISTRIBUTOR

Engine	199-232	232	All V-8
Diaphragm Type	Dual Dia.	Single Dia.	Dual or Single Dia.
Rotation—	← C W →		
Point Opening	← .016" → (at Rotor End)		
Cam Angle (Dwell)	31°-34°	31°-34°	29°-31°
Breaker Lever Tension	← 17-21 oz. →		
Condenser Capacity	← .18-.23 MFD →		

CENTRIFUGAL ADVANCE

(Distributor Degrees and RPM)

Engine	199-232	232	304-2V	304-360 2V	360 4V	390-4V
Diaphragm	Dual Dia.	Single Dia.	Dual Dia.	Dual Dia.	Dual Dia.	Single Dia.
Distributor Model	1110481	1110444	1112018	1111988	1111987	1111473
Start	0°-2°@ 450	2°-3°@ 450	0°-2°@ 500	0°-2°@ 500	0°-2°@ 450	0°-1°@ 400
Interim	7°-9°@ 1050	8°-10°@ 1000	4.5°-6.5°@ 800	5°-7°@ 825	6°-8°@ 750	8.5°-10.5°@ 800
Max.	11°-13°@ 2250	12°-14°@ 2200	12°-14°@ 2200	12°-14°@ 2100	11°-13°@ 2000	14°-16°@ 2200

VACUUM CONTROL

Engine		199-232	232	304-2V	304-360 2 or 4V	390-4V
Diaphragm Type		Dual	Single	Dual	Dual	Single
Model Number		1973425*	1116207*	1973429*	1973426*	1115363*
Inches of Mercury to:	Start Advance	5"-7"	5"-7"	—	5"-7"	8"-10"
	Full Advance	14½"	16"-17"	—	14½"	18.5"-20.5"
	Max. Advance	9° ± 1°	11°	—	9° ± ¾°	12°
Inches of Mercury to:	Start Retard	5"	—	5"	5"	—
	Full Retard	14"	—	14"	14"	—
	Max. Retard	4° ± ¾°	—	5° ± ½°	5° ± ½°	—

*Last Three Numbers Appear on Vacuum Unit

IGNITION RESISTANCE WIRE

Resistance @ 70°F. ..... 1.35±0.5 OHM (304-360-390)
1.80±0.5 OHM (199-232)

PRIMARY CIRCUIT VOLTAGE DROPS

Positive battery cable to ignition primary terminal of ignition coil (4 Amp. fuse and fuse panel). — Not to exceed .4 Volt

Ignition Cables (Resistance Value Per Foot) — Spark Plug Lead—3000-7000 OHMS; Coil Lead—7500-12,500 OHMS

SPARK PLUG (CHAMPION)

Engine	6 Cyl.	V-8
Number	N14Y	N12Y
Gap	← .033"-.037" →	
Torque	← 25-30 Ft. Lbs. →	
Thread	← 14MM 3/4" Proj. Core →	

IGNITION TIMING AND ENGINE IDLE RPM

When equipped with Air Conditioning, the final idle RPM must be set with Air Conditioning "OFF."

ENGINE CID	TRANS TYPE	VACUUM UNIT: Hose/s Disconnected 500 RPM	VACUUM UNIT: Retard Hose Connected 500 RPM or Less	VACUUM UNIT: Advance Hose Connected 2000 RPM#	Final Idle Speed (RPM): Auto*	Final Idle Speed (RPM): Manual
199-232 (Except 01-232 Auto. Trans.)	All	3° BTDC	3½°-6½° ATDC	29°-37°	550	600
232 (01 Auto. Trans. Only)	Auto	3° BTDC	—	38°-42°	550	
304-360 2V (Except 304 Auto Trans.)	All	5° BTDC	4°-6° ATDC	28½°-35½°	600	650
304-2V	Auto	5° BTDC	4°-6° ATDC	12°-16°	600	
360-4V	All	5° BTDC	4°-6° ATDC	30½°-37½°	600	650
390-4V	All	TDC	—	41°-47°	600	650

#Checked only with adjustable timing light. Adjust to ATDC spec. if equipped with dual diaphragm unit and TDC with single diaphragm.
*Set Parking Brake Firmly. Do Not Accelerate Engine.

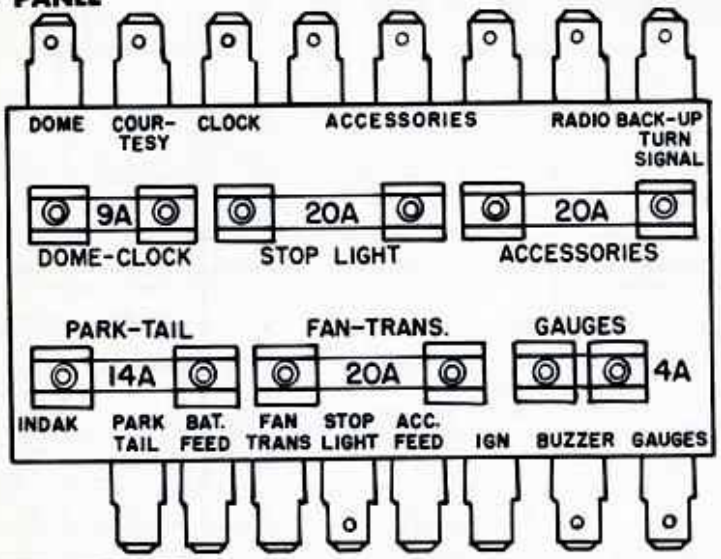
FUSES, CIRCUIT BREAKERS AND FUSIBLE LINKS

Electrical circuits are protected with fuses that are mounted on a fuse panel which is located to the far left side under the instrument panel. Circuit breakers and fusible links are used on some individual circuits.

SCOPE ANALYZER SPECIFICATIONS

Cranking Voltage—Engine at normal operating temperature	9.6 V. Min.
Cranking Vacuum—This test must have battery operating voltage. Completely closed throttle plates. PCV valve completely closed.	9" Min.
Coil Output—When cranking coil H.T. lead removed from dist. battery voltage of 9.6 min.	24 KV Min.
Dwell	31°-34° (6), 29°-31° (V-8)
Dwell Variation—Between Idle to 1000 RPM (On dwell meter)	3° Max.
Cam Lobe Variation—At 1000 RPM	2° Max.
Spark Plug—Firing Voltage at 1000 RPM	5-14 KV
Fuel Mixture—At Specified Idle	14.0:1 ± .2 A.F.R. With Air Guard 13.0:1 A.F.R.
Fuel Mixture—At 1000 RPM	15.0:1 A.F.R.
Acceleration Pump—Snap throttle from 1000 RPM	1-1½ A.F.R. Enrichment
Rotor Gap—At 1000 RPM	5-8 KV
Maximum Starter Draw	180-220 Amps.

FUSE PANEL



CIRCUIT BREAKERS

Circuit Protected	Rated Amps	Location
Headlamps	20	In Switch
Windshield Wipers	6	In Switch
Electric Windows	20	Inst. Panel
Tailgate, Front Switch	20	Inst. Panel
Tailgate, Rear Switch	20	Inst. Panel

FUSIBLE LINKS

Location	Color	Protects
Battery terminal of starter relay to main wire harness	Red	Complete Wiring
Battery Terminal of horn relay to main wire harness	Pink	Horn Circuit
Accessory terminal of ignition switch to wire harness	Brown	Electric Tailgate Instrument Panel Switch, Cigarette Lighter, all Accessories from Fuse Panel and Electric Windshield Wiper
Battery Terminal of starter relay to junction block for "Rally Pac" ammeter (30-70 Series)	Black	"Rally Pac" Wiring

BULB CHART

Applications	Series 01	10	30	70	80
Back-up	←		1156		→
Cargo		561			561
Clock	←		1816		→
Control Illuminations	←		1445		→
Console			211	211	
Courtesy	94	94	211	211	94
Dome	561	561			561
Gear Selector—LAW	←		1816		→
Gear Selector—WAW		←	1445		→
Gear Selector—WFS		←	1445		→
Glove Box	←		1891		→
Indicator & Instrument Ill.	←		158		→
License Plate	←		2286V		→
Low Fuel Warning	←		257		→
Map Light				561	
Park Brake Warning	←		257		→
Park & Turn Signal	←	1157	1157-A	1157	→
Rear Quarter		561		561	561
Stop & Tail	←		1157		→
Side Marker—Front	←		194		→
Side Marker—Rear	1895	←	194		→
Tachometer	←	1895		1895	→
Tail					1095
Radio	←		1815		→
Trunk	←		89		→
Head lamp—Single	6012		6012	6012	
Head lamp—Low		4002			4002
Head lamp—Hi		4001			4001

EMISSION CONTROL SYSTEMS

Three systems are used; "Engine-Mod," "Air Guard" and "Evaporative Emission Control." The following chart outlines the components used in each system.

Engine Mod	Air Guard	Evaporative Emission Control (Calif. Only)
6 Cyl.—All V-8—Auto. Trans.	V-8—Man. Trans.	All Engines
"Low-Quench" Combustion Chamber 199-232	"Air-Guard" Air Pump System	Closed Fuel Tank Vent System
"Thermostatically-Controlled" Carburetor Air-Cleaner	"Thermostatically-Controlled" Carburetor Air Cleaner (4V Only)	Fuel Expansion Tank Filler Cap Relief Valve
Emission Calibrated Distributor and Carburetor		
"Closed" Positive Crankcase Ventilation System		

ENGINE IDLE SETTING PROCEDURES

The engine and all related systems must be in proper operating condition prior to performing carburetor idle speed and mixture adjustments. The idle speed and mixture adjustments must be made with the engine at operating temperature and air cleaner in place.

Plastic idle limiter caps are installed over the idle mixture screw(s) on all carburetors. The limiters are designed to regulate the adjustment range of the idle mixture screw(s), thereby, effectively controlling the exhaust emission level at idle speeds to comply with Federal Standards for emission control.

The limiter caps are never to be damaged in any way to gain an adjustment beyond the normal range of the limiter. In isolated cases, when idle quality is unsatisfactory after performing a normal adjustment, refer to "Corrective Procedures to Improve Idle Quality" in the "EMISSION CONTROL" section of the Technical Service Manual.

Proper idle speed and mixture adjustments can be made by following a standard tachometer procedure, in which the idle mixture is adjusted to obtain a "lean best idle" setting. An optional combustion analyzer procedure, in which the idle mixture is adjusted to obtain a specified air-fuel ratio, may also be used. When following either the standard or optional procedure, adjustments must be made in the exact detailed sequence outlined to obtain "lean best idle" settings and satisfactory idle quality.

CAUTION: Set park brake firmly. Do not accelerate engine.

TACHOMETER PROCEDURE (Standard)

To compensate for fuel and temperature variations while performing the idle mixture adjustment:

A—Do not idle engine for over 3 minutes at a time.

B—If the idle mixture adjustment is not completed within 3 minutes, run engine at 2000 RPM for one (1) minute.

C—Recheck the idle mixture adjustment at the specified RPM and adjust as required. If the idle mixture adjustment is not completed within three (3) minutes, repeat Step B.

IMPORTANT: The tachometer used should have an expanded scale of 400 to 800 or 0 to 1000 RPM. The instrument should be periodically inspected and calibrated to allow not more than 2% error.

Start engine and allow to warm up to operating temperature. Adjust idle speed to specified RPM. If equipped with "Air Guard" stop engine and disconnect by-pass valve air inlet hose prior to idle mixture adjustment.

6 Cylinder with Manual Transmission—600 RPM
6 Cylinder With Automatic Transmission—550 RPM in "DRIVE" range
V-8 with Manual Transmission—650 RPM
V-8 with Automatic Transmission—600 RPM in "DRIVE" range

Adjust Idle Mixture as follows:

Starting from the full rich stop(s), turn mixture screw(s) clockwise (leaner) until a loss of engine RPM is indicated, then, turn mixture screw(s) counterclockwise (richer) until the highest RPM reading is obtained at the "lean best idle" setting. On carburetors incorporating two mixture screws, turn both screws equally unless the engine demands otherwise. If the idle speed changed more than 30 RPM during the mixture adjustment, reset to the specified RPM and repeat the adjustment. Adjust final curb idle speed.

Connect by-pass valve air inlet hose.

NOTE: If unable to obtain satisfactory idle quality when adjusting according to the foregoing procedure, the idle speed and mixture may be adjusted as outlined under "Corrective Procedures to Improve Idle Quality" in the Emission Control section of the Technical Service Manual.

POSITIVE CRANKCASE VENTILATION (PCV) VALVE

The positive crankcase ventilation system prevents crankcase vapors from entering the atmosphere under varying engine conditions. The system will work efficiently when the correct PCV valve is installed and the system maintained in serviceable condition.

The valve must be replaced and the system hoses inspected and cleaned at the mileage intervals specified in the Protective Maintenance Schedule.

American Motors PCV valves may be identified as to engine application by the color of the valve, as shown in the following chart.

PCV VALVE FLOW (C.F.M.) CHART

ENGINE MANIFOLD VACUUM			Air Flow	C.F.M.
			232-304-360-390	199-232
		In. Hg.	Black Color Valve	Silver Color Valve
IDLE TEST POINT	Min. Flow	20	1.3-1.7	1.3-1.7
		18	1.3-1.7	1.3-1.7
		16	1.3-1.7	1.3-1.7
		14	1.5-2.0	1.3-1.7
		12	1.7-2.5	1.3-1.7
		10	2.1-2.8	1.3-1.7
		8	2.4-3.4	1.3-1.7
CRANKING* SPEED TEST POINT	Max. Flow	6	2.7-3.7	1.3-1.7
		4	3.2-4.2	1.7
		2	3.3-4.4	1.7

* Coil Secondary Wire Removed and Grounded, Carburetor Throttle at Curb Idle.

PCV VALVE TEST

PCV Valve Tester J-23111 will test the valve and system for correct flow rate (CFM).

The valve may be tested for minimum flow rate using two different manifold vacuum test points as indicated in the "PCV Valve Flow Chart."

To test, remove the PCV valve from the grommet in the intake manifold (V-8) or cylinder head cover (Six Cylinder), connect the valve to the tester hose.

Connect a vacuum gauge to read intake manifold vacuum.

NOTE: The PCV valve must be in a horizontal position and be lightly tapped during tests and the tester should be held in a vertical position.

Start the engine, allow to idle, compare vacuum and tester readings to flow chart, record reading.

Stop the engine. Remove secondary coil wire from distributor cap and ground to engine.

NOTE: Throttle must be at curb idle position (off fast idle) for cranking speed test.

Crank engine, compare vacuum and tester readings with chart.

A valve that flows above or below the chart specification in either test, must be cleaned or replaced.

Replacement should be made with the correct American Motors PCV valve.

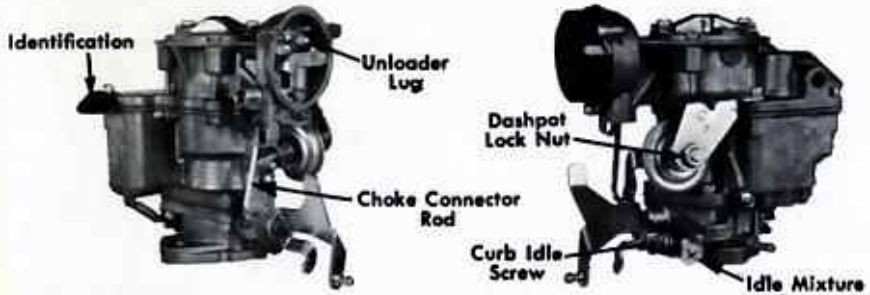
FUEL PUMP SPECIFICATIONS

Fuel Pump Pressure 4 to 5-1/2 P.S.I. on Six cylinder engines and 5 to 6-1/2 P.S.I. on V-8 engines.

Fuel Pump Volume—One Quart in One Minute @ 500 R.P.M.

Vacuum Test—14" to 19" Hg @ 1000 RPM.

MODEL YF—ONE VENTURI CARBURETOR



01—199-232 CID—MAN. TRANSMISSION—CODE NUMBER 4768S
01—199,232 CID—AUTO. TRANSMISSION—CODE NUMBER 4767S
10, 70—232 CID—MAN. TRANSMISSION—CODE NUMBER 4770S
10, 70—232 CID—AUTO. TRANSMISSION—CODE NUMBER 4769S

Float Level—With carburetor inverted and fuel bowl removed, measure the distance between the top of the float, at the free end, and the air horn casting. Bend float arm to adjust.

All ..... 29/64" (.450") Gauge

Float Drop—With float hanging freely, measure distance between top of float and air horn casting. Adjust by bending tab at rear of float lever.

All ..... 1¼"

Automatic Choke—Rotate cover to adjust.

All ..... Index

Fast Idle Speed—With the engine at operating temperature, position the choke trip lever on the high step of the fast idle cam. Adjust by bending the choke connector rod at the lower angle.

All ..... 2300 RPM

Metering Rod—With throttle completely closed, pump diaphragm shaft depressed and metering rod bottomed, the metering rod eyelet should slide freely on the metering rod arm pin. Adjust by bending the metering rod pin tab.

Unloader—With throttle fully open and choke valve held toward the closed position, measure the clearance between the lower edge of the choke valve and the air horn wall. Adjust by bending the unloader lug on the choke trip lever.

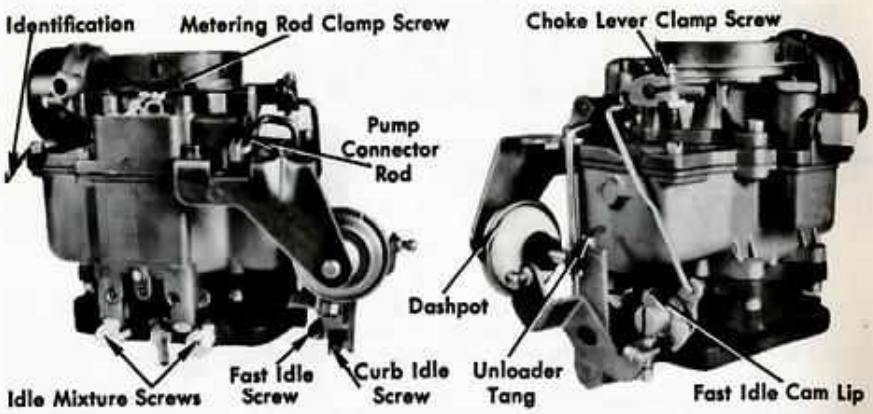
4768S, 4770S ..... 19/64" (.300") Gauge
4767S, 4769S ..... 9/32" (.275") Gauge

Dashpot—With dashpot stem fully depressed, measure clearance between stem and throttle lever at curb idle. Adjust by turning dashpot.

4768S ..... 7/64" (.120") Gauge
4770S ..... 3/32" (.095") Gauge

Idle Speed—Refer to "Engine Idle Setting Procedures."

MODEL WCD–TWO VENTURI CARBURETOR



232 CID—MAN. TRANSMISSION—CODE NUMBER 4950S(01), 4871S(10-80)
232 CID—AUTO. TRANSMISSION—CODE NUMBER 4816S(10-80)

Float Level—Invert bowl cover and measure clearance between tops of floats and bowl cover, gasket removed. Bend float arms to adjust.
All ..... 7/32" (.215") Gauge

Automatic Choke—Rotate cover to adjust.
All ..... Index

Fast Idle Cam Linkage—With specified gauge between lip of fast idle cam and throttle body boss, hold choke valve and linkage toward closed position. Tighten clamp screw.
All ..... (.006") Gauge

Fast Idle Speed—With engine at operating temperature, align fast idle screw with high step of fast idle cam. Turn screw to adjust.
All ..... 2000 RPM

Accelerator Pump—With throttle valves closed, top surface of pump arm must be parallel with dust cover boss. Bend connector rod at upper angle to adjust.

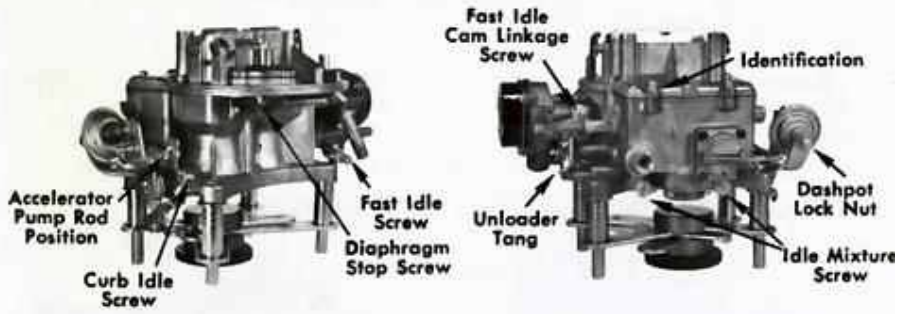
Metering Rod—With throttle valves closed and pump adjustment completed, hold metering rods in maximum down position. Rotate metering rod arm until finger contacts lip of vacuumeter link. Tighten clamp screw.

Unloader—With throttle fully open and choke valve held toward the closed position, measure clearance between upper edge of choke valve and air horn. Bend tang on throttle lever to adjust.
All ..... 3/16" (.190") Gauge

Dashpot—With dashpot stem fully depressed, measure clearance between stem and throttle lever at curb idle. Turn dashpot to adjust.
All ..... 3/32" (.095") Gauge

Idle Speed—Refer to "Engine Idle Setting Procedures."

MODEL 2100–TWO VENTURI CARBURETOR



304 CID—MAN. TRANSMISSION—CODE NUMBER ODM2
304 CID—AUTO. TRANSMISSION—CODE NUMBER ODA2
360 CID—AUTO. TRANSMISSION—CODE NUMBER ORA2

Float Level (Dry)—With air horn and gasket removed, raise float until fuel inlet needle is lightly seated. Measure the distance from the fuel bowl machined surface to the flat surface of the float at the free end.
All ..... 3/8" ("T" Scale)

Fuel Level (Wet)—Idle engine minimum of three minutes to stabilize fuel level. Remove gasket and air horn. With engine idling, measure distance from fuel bowl machined surface to surface of fuel. Measurement must be made at least ¼" away from any vertical surface. Bend tab on float lever to adjust. Stop engine while adjusting.
All ..... 13/16" ("T" Scale)

Initial Choke Valve Clearance—Rotate choke cover ¼ turn counterclockwise (rich) from index. With choke valve completely closed, press down on choke modulator arm until modulator diaphragm is bottomed. Measure the clearance between the lower edge of the choke valve and the air horn. Adjust by turning diaphragm stop screw.
ODM2 ..... 17/64" (.260") Gauge
ODA2 ..... 19/64" (.300") Gauge
ORA2 ..... 11/32" (.350") Gauge

Fast Idle Cam Linkage—Align fast idle screw with fast idle cam index mark (second step). Measure clearance between lower edge of choke valve and air horn. Adjust by turning the fast idle cam lever screw.
All ..... 11/64" (.170") Gauge

Automatic Choke—Rotate cover to adjust.
ODM2 ..... Index
ODA2 ..... 2 Notches Rich
ORA2 ..... 1 Notch Rich

Fast Idle Speed—With engine at operating temperature, align fast idle screw with index mark on fast idle cam. Turn screw to adjust.
All ..... 1600 RPM

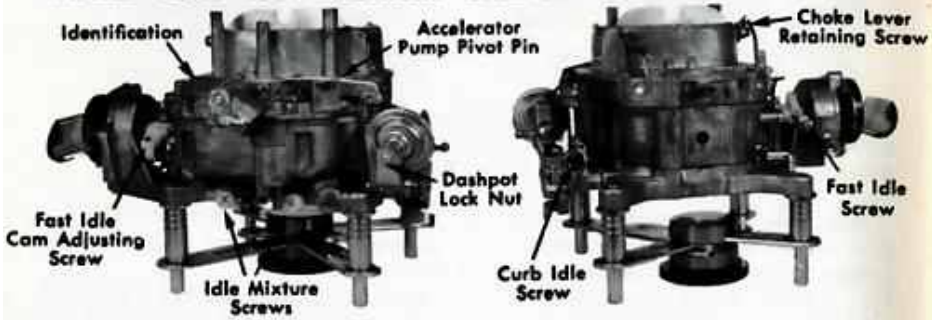
Accelerator Pump Rod Position—Install rod in specified hole of pump lever and throttle over-travel lever. Holes on throttle lever numbered from throttle shaft out.
All ..... No. 3 Hole—Throttle Lever

Unloader—With throttle fully open and choke valve held toward the closed position, measure the clearance between lower edge of choke valve and air horn. Bend tang on fast idle speed lever to adjust.
All ..... 13/64" (.200") Gauge—Min.

Dashpot—With dashpot stem fully depressed, measure the clearance between stem and throttle lever at curb idle. Turn dashpot to adjust.
All ..... ⅛" (.125") Drill

Idle Speed—Refer to "Engine Idle Setting Procedures."

MODEL 4300—FOUR VENTURI CARBURETOR



360, 390 CID—MAN. TRANSMISSION—CODE NUMBER OWM4
360, 390 CID—AUTO. TRANSMISSION—CODE NUMBER OWA4

Float Level—Invert the air horn and use a "T" scale to measure the distance from the floats to the air horn casting. Bend tab which contacts inlet needle to adjust.
All ..... 13/16" ("T" Scale)

Initial Choke Valve Clearance—Insert a .035" gauge into the slot at the front of the choke piston passage and rotate the piston lever counterclockwise until the piston contacts the gauge. Measure the clearance between the lower edge of the choke valve and the air horn wall. Adjust by rotating the choke lever on the choke shaft.
OWM4 ..... 3/16" (.190") Gauge
OWA4 ..... 11/64" (.170") Gauge

Fast Idle Cam Linkage—With choke valve tightly closed, align fast idle screw with middle step on fast idle cam measure clearance between lower edge of choke valve and air horn. Turn fast idle cam adjusting screw to adjust.
OWM4 ..... 13/64" (.200") Gauge
OWA4 ..... 3/16" (.190") Gauge

Automatic Choke—Rotate cover to adjust.
All ..... 2 Notches Rich

Fast Idle Speed—With engine at operating temperature, align fast idle screw with middle step on fast idle cam. Turn screw to adjust.
All ..... 1600 RPM

Accelerator Pump Pivot Pin Location ..... Center Hole

Unloader—With throttle fully open and choke valve held toward closed position, measure clearance between lower edge of choke valve and air horn. Bend tang on fast idle lever to adjust.
All ..... 19/64" (.300") Gauge

Dashpot—With dashpot stem fully depressed, measure clearance between stem and throttle lever at curb idle. Turn dashpot to adjust.
OWM4 ..... 1/16" (.065") Gauge
OWA4 ..... ⅛" (.125") Drill

Idle Speed—Refer to "Engine Idle Setting Procedures."

CLUTCH

DRIVEN MEMBER — DIAMETER

199-232	9-⅛"
304	10"
360-390	10-½"

CLUTCH PEDAL FREE TRAVEL
7/8" to 1-1/8"—1" Desired

CLUTCH PEDAL ADJUSTMENT

232-304-360	Aligning Pin
199 only	No Adjustment

Clutch Lever Height	Engine CID
3/32" Below Hub	199-232
1/32" Above Hub	304—3 Speed
3/32" Above Hub	360-390—4 Speed

CLUTCH HOUSING ALIGNMENT

Maximum Indicator Reading of Clutch Housing Bore Concentricity to Center Line	.010"
Maximum Indicator Reading of Clutch Housing Transmission Mounting Face to Crankshaft Center Line	.010"

TORQUE LIMITS—FOOT POUNDS

Clutch Cover Screw	40
Clutch Housing to Motor Dowel Bolt Nut	45
Clutch Housing to Motor Screw 304-360-390	45
Clutch Housing to Engine Block Screw 199-232 (Top)	35
(Bottom)	45
304-360-390	30
Clutch Housing Spacer to Block Screw 304-360-390	15
Clutch Throwout Lever Pivot	35
Transmission Case to Clutch Housing Screw	55

PEDAL ADJUSTMENT

232 CID AND ALL V-8 ENGINES

Clutch pedal height is important to obtain proper clutch pedal and overcenter spring operation.

To obtain the correct clutch pedal height, insert a 5/16" pin approximately 4-1/2" long through the two aligning holes in the clutch pedal support bracket. Adjust the pedal stop until the pedal lever hole aligns with the pin and the pin slides freely through all three holes.

After the clutch pedal height is adjusted, clutch free play must be adjusted.

MANUAL TRANSMISSIONS

TRANSMISSION MODEL	T-96M	T-96J	T-14	T-15	T-10
ENGINE (CID)	199(01)	232(01)	232(10-70-80)	304-360(01-10-30-70)	360-390(10-30-70)
CAPACITIES (Pints)	1.5	1.5	2.5	3.0	2.5
GEAR RATIOS					
1st	3.100	2.605	2.636	2.548	2.23
2nd	1.797	1.630	1.605	1.558	1.77
3rd	1.00	1.00	1.00	1.00	1.35
4th	—	—	—	—	1.00
Reverse	4.219	3.536	2.636	2.548	2.16
INTERNAL CLEARANCES					
Gear End Play					
1st Speed Gear	—	—	.003"-.012"	.003"-.014"	.003"-.021"
2nd Speed Gear	.003"-.010"	.003"-.010"	.003"-.018"	.003"-.018"	.003"-.014"
3rd Speed Gear	—	—	—	—	.003"-.018"
Countershaft Gear	.003"-.006"	.003"-.006"	.005"-.019"	.005"-.018"	.003"-.012"
Interlock Sleeve Clearance	.001"-.007"	.001-.007"	—	—	.002"-.008"

First and second speed gear end play is governed by selective fit of main shaft, gear, and synchro-clutch.

Countershaft gear end play is governed by bronze thrust washers.

SHIFT-COMMAND AUTOMATIC TRANSMISSION

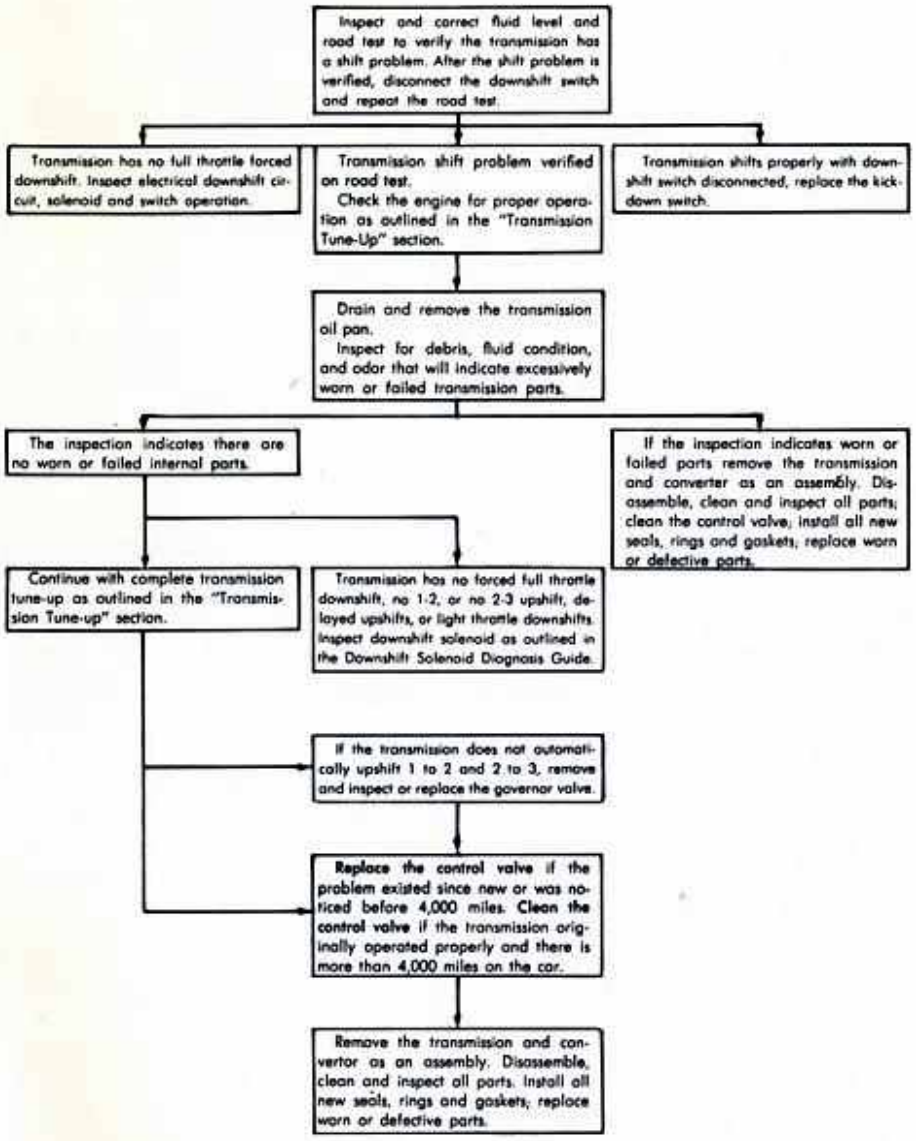
DIAGNOSIS GUIDE

In most instances, the customer will describe the Shift-Command transmission difficulty as one of the following type problems:

IMPROPER TRANSMISSION SHIFTS (GUIDE "A")
ABNORMALLY NOISY (GUIDE "B")
FLUID LEAKS (GUIDE "C")
CAR WILL NOT MOVE (GUIDE "D")

When it has been determined that a transmission complaint exists, use the corresponding diagnosis guide.

GUIDE "A" — IMPROPER TRANSMISSION SHIFTS



GUIDE "B" — ABNORMAL NOISE

Inspect and correct the transmission fluid level, road test to verify that an abnormal noise exists, identify the type of noise, driving ranges, and conditions when the noise occurs.

- **Gear noise or grinding** → Remove the transmission and converter as an assembly; disassemble, clean and inspect all parts; clean the control valve; install all new seals, rings, and gaskets; replace worn or defective parts.
- **Whine or buzz noise** → Listen to transmission and converter for source of noise.
  - **Transmission has buzz or whine** → Remove the transmission pan; inspect for debris indicating worn or failed parts.
    - **No debris present** — Replace control valve if problem existed since new or noticed before 4,000 miles. Clean control valve if transmission originally operated properly and there is more than 4,000 miles on the car.
    - **Debris present** — Remove transmission and converter as an assembly; disassemble, clean and inspect all parts; clean the control valve; install all new seals, rings and gaskets; replace worn or defective parts.
  - **Converter has loud buzz or whine** → Replace torque converter
- **Knock, click, or scrape noise** → Remove torque converter and inspect for loose or cracked converter drive plate; inspect for contact of the starter drive with the starter ring gear.

GUIDE "C" — FLUID LEAKS

Visually inspect for source of leak. If the source of leak cannot be readily determined, clean the exterior of the transmission. Check transmission fluid level. Correct if necessary.

The following leaks may be corrected without removing the transmission:

- Manual lever shaft oil seal.
- Downshift wire terminal case plug seal.
- Pressure gauge plug.
- Vacuum control unit "O" ring seal.
- Pan gasket.
- Oil cooler fittings.
- Extension housing to case gasket.
- Rear case adapter plugs (M-11B, M-12 only).
- Rear oil seal.
- Speedometer adapter "O" ring.

The following leaks require removal of the transmission and torque converter for correction.

Transmission fluid leaking from the lower edge of the converter housing; caused by front pump seal, pump to case gasket, or torque converter weld.

Cracked or porous transmission case.

GUIDE "D" — CAR WILL NOT MOVE

Check the transmission fluid level before starting the engine. If no fluid is visible on the dip stick add fluid to the "L" mark before starting the engine. Then start the engine with the transmission in neutral and listen for noise.

- **No abnormal noise, move the selector to a forward drive range and observe the propeller shaft for turning.**
  - **Propeller shaft turns but rear wheels do not turn, inspect for broken rear axle parts.**
  - **Propeller shaft does not turn, remove the transmission oil pan. Inspect for debris.**
    - **No debris, internal linkage disconnected. Repair linkage problem.**
    - **No debris and linkage is connected.** Remove the transmission and converter as an asembly; disassemble, clean, and inspect all parts; clean the control valve; install all new seals, rings and gaskets; replace worn or defective parts.
    - **Debris is present.** Remove transmission and converter as an assembly; disassemble, clean and inspect all parts; clean the control valve; install all new seals, rings, and gaskets; replace worn or defective parts.
- **Abnormal noise, stop engine immediately,** remove the transmission and converter as an assembly. Disassemble, clean and inspect all parts. Clean control valve; install all new seals, rings, and gaskets; replace worn or defective parts.

Shift-Command Transmission Overhaul Diagnosis Chart

ENGAGEMENTS	Code
Harsh	c f
Delayed Forward	a z
Delayed Reverse	a
None	a k l m o
No Forward D	a b l z
No Forward 2	a b z
No Reverse	a s h
No Neutral	c

UPSHIFTS	
No 1-2	a y n
No 2-3	a e t y n
Shift Points Too High	e n
Shift Points Too Low	e

UPSHIFT QUALITY	
1-2 Delayed Followed Close By 2-3 Shift	a b g
2-3 Slips	e e g i n
1-2 Harsh	b
2-3 Harsh	f
1-2 Ties Up	f j

DOWNSHIFTS	
No 2-1 in D	i y
No 2-1 in 1	h y
No 3-2	g y
Shift Points Too High	e
Shift Points Too Low	a

FORCED DOWNSHIFTS	Code
3-1 Slips	b l z
3-2 Slips	a e g f
3-1 Shifts Above—mph	a g
2-1 Harsh	a b i
3-2 Harsh	e f

REVERSE	
Slips Or Chatters	a c e h r
Tie Up	a c

LINE PRESSURE	
Low Idle Pressure	a m
Low Stall Pressure	a m y

STALL SPEED	
Too Low (300 RPM Or More)	a
Too High D	u v a b i k o r
Reverse Too High	u v h e k o

OTHERS	
Poor Acceleration	y a
Noisy in Neutral	f p d a
Noisy in Park	p d a
Noisy in All Gears	p r a
Noisy in 1st & 2nd Gear Only	p r w
Park Brake Does Not Hold	q
Oil Out Breather	a x s-1
Oil Out Fill Tube	a x s-1
Ties Up In 1, 1st Gear	f a
Ties Up In D, 1st Gear	f a
Ties Up In 2nd Gear	f a j
Ties Up In 3rd Gear	f a j
Chatters—D, 2 or 1	a b z

Correction Code Key

- a. Sealing rings missing, leaking or broken
- b. Front clutch slipping, worn plates or faulty parts
- c. Front clutch seized or distorted plates
- d. Front clutch hub thrust washer missing (detectable in N, P, R only)
- e. Rear clutch slipping, worn or faulty parts
- f. Rear clutch seized or distorted plates
- g. Front band worn or broken
- h. Rear band worn or broken
- i. One-way (sprag) clutch slipping or incorrectly installed
- j. One-way (sprag) clutch seized
- k. Broken input shaft
- l. Pump drive tangs or converter hub broken
- m. Pump worn
- n. Downshift solenoid
- o. Converter
- p. Pump
- q. Parking linkage
- r. Planetary assembly
- s. Fluid distributor sleeve in output shaft (V-8)
- t. Rear clutch piston ball check leaks
- u. Broken output shaft
- v. Broken gears
- w. Forward sun gear thrust washer missing
- x. Breather baffle missing
- x-1 Fluid aerated or overfull
- y. Output shaft plug missing (6 cyl.)
- z. Front clutch piston check valve leaks

SHIFT-COMMAND "TUNE-UP"

FLUID LEVEL CHECK

Only AM automatic transmission fluid or "Dexron" must be used to fill the transmission.

NOTE: Cold weather automatic transmission fluid, Part Number 8992375. may be used to improve initial transmission operation and decrease transmission warm-up time in cold weather.

This fluid must be used as an additive only. NEVER USE MORE THAN 3 QUARTS.

The F "FULL" mark on the fluid level indicator (dip stick) is calibrated to indicate full. When the transmission fluid is at the normal (190°F.) operating temperature.

This operating temperature can only be obtained after a minimum of 15 highway miles or the equivalent of city driving.

If the transmision is filled to the "F" mark on the dip stick when cool or moderately warm, an overfilled condition will exist when the fluid is at normal operating temperature.

Overfilled transmissions will cause the fluid to aerate. Aerated fluid will lower transmission pressure and may result in fluid being forced out of the vent or fill tube.

Fluid Level Check at Operating Temperature

The vehicle must be level for an accurate check.

Apply the parking brake and start the engine.

Place the selector lever in neutral, check the fluid level indicated on the dip stick, it should be at the "F" full mark.

Fluid Level Check When Cold

It may be impractical to drive the car to obtain the desired normal operating temperature, therefore, the fluid level may be checked at room temperature (70°F.) in the following manner:

The vehicle must be level for an accurate check. Apply the parking brake and start the engine.

Move the selector lever to all drive range positions and return the lever to neutral. With the engine idling, the oil level should be at the level indicated in the following chart:

Transmission Model	Fluid Level
M-42	1/4" below "L"
M-43	1/4" below "L"
M-44	5/16" above "L"
M-11B	"L"
M-12	"L"

Refilling After Draining

The M-42, 43 and 44 transmission capacities are approximately 9 quarts; the M-11B and 12 transmission capacities are approximately 11 quarts.

The amount of fluid drained from the transmission to perform repairs is dependent on extent of the repair. Transmission overhaul or replacement usually requires more fluid to obtain the correct level because the units have been completely drained. Initial filling of 4 quarts of fluid is suggested.

If the transmission pan was removed for internal service only, an initial fill of 3 quarts may be used.

Apply the parking brake and place the selector lever in neutral and start the engine. DO NOT RACE THE ENGINE.

Add fluid and check the level until fluid is visible on the dip stick.

Move the selector lever momentarily to all positions to fill the units and then return the selector to neutral.

NOTE: Avoid operating in drive ranges with the brakes applied, because the fluid will warm up and an accurate cold level check cannot be made. Continue to add fluid until it is at the specified cold level.

LINKAGE ADJUSTMENT

Column Shift Adjustment

Place the column selector lever in the (N) Neutral position, then place the transmission shift lever in the Neutral position and adjust the shift rod trunnion to a "free" pin fit. Place the column selector lever in the (P) Park position and check column lock for ease of operation.

Console Shift Adjustment

Loosen the park lock-up rod trunnion lock nuts approximately ½" for each nut to permit free movement of the lock-up rod in the trunnion.

Place the console selector lever in the (N) Neutral position, then place the transmission shift lever in the neutral position and adjust the shift rod to a "free" pin fit. Place the console selector lever in the (P) Park position and lock the steering column.

NOTE: It may be necessary to move the lower column lever upward until it is in the locked position.

Tighten the lower trunnion lock nut until it contacts the trunnion, then tighten the upper lock nut while holding the trunnion centered in the column lever.

Front Band Adjustment (Self-Adjusting)

To verify, insert a .250" gauge between actuating arm and servo body. Tighten adjusting screw to 10 Inch Pounds torque.

NOTE: M-11B and M-12 front servo adjusting screws have left hand threads.

Rear Band Adjustment

Remove cross member at side sills and lower the transmission for access to the adjusting screw. Loosen the adjusting screw lock nut and tighten the adjusting screw with Tool J-22698 until tool clicks. Back off adjusting screw 3/4 turns (199, 232, and 304 CID engines). Back off adjusting screw 1-1/4 turns 360 and 390 CID engines). Tighten lock nut. Raise transmission and tighten crossmember to side sill bolts.

CAUTION: It is necessary to open the hood to avoid damage to the hood and air cleaner whenever the rear crossmember is removed.

FRONT BAND ADJUSTMENT

REAR BAND ADJUSTMENT

CONTROL PRESSURE ADJUSTMENT

Connect oil pressure gauge to transmission.
Connect vacuum gauge.
Connect tachometer to engine.
Apply Park Brake and block wheel.

With engine running at a normal operating temperature, place selector lever in reverse. Accelerate engine to obtain the vacuum listed on the transmission pressure chart. The pressure gauge must indicate pressure listed on the transmission pressure chart.

Adjust vacuum control unit to obtain correct pressure.

When pressure is adjusted to specification in "R" (Reverse), move selector lever to each of the forward ranges and check the pressure at the specified vacuum. The pressure should match the chart. **Do Not Adjust** the pressure in forward ranges.

When pressure is not correct in the forward ranges, check governor for sticking. If governor is free refer to the Diagnosis Guide.

When pressure cannot be adjusted to specifications in "R" (Reverse), inspect the vacuum control for leak. If vacuum control is satisfactory, check for restriction or leak in vacuum line from the engine and check the length of the Vacuum Unit Push Rod. (Altitude Compensator Push Rod is 3.439" ± .005", Diaphragm Type Push Rod is 4.116" ± .005".) If the problem still is present, refer to the Diagnosis Guide.

TRANSMISSION PRESSURES			
Engine Type CID	Vacuum	(R) Reverse	D, 2, 1
199	8.0"	95 ± 5 P.S.I.	90-100 P.S.I.
232	13.5"	95 ± 5 P.S.I.	90-100 P.S.I.
304	13.5"	95 ± 5 P.S.I.	90-100 P.S.I.
360	13.5"	115 ± 5 P.S.I.	75-85 P.S.I.
390—4V	15.0"	120 ± 5 P.S.I.	75-85 P.S.I.

Idle Pressure, check with engine at normal operating temperature.		
	Reverse	Forward
199 CID Engine	55-68 P.S.I.	55-68 P.S.I.
304 CID Engine	55-68 P.S.I.	55-68 P.S.I.
360-390 CID Engine	57-67 P.S.I.	42-52 P.S.I.

ELECTRICAL DOWNSHIFT

No 2-3 Upshift

If no 2-3 shift occurs, disconnect wire from downshift switch and road test. If the 2-3 shift occurs on the road test the problem is in the switch.

Forced Downshift

If no forced downshift occurs check the operation of the solenoid by disconnecting the solenoid wire at transmission case and connecting a jumper wire to the positive terminal of the battery. Momentarily energize the solenoid by touching the jumper wire to the solenoid connector. If a click is audible from the solenoid, the solenoid is operating satisfactorily and the problem may be the downshift switch. If no click occurs the problem may be the valve body solenoid.

TRANSMISSION POWER FLOW AND RATIOS

199-232 and 304 CID Engines

Gear	Selector Lever Position	Clutch Applied	Band Applied	Gear Ratio
Neutral	N	None	None	
First	D or 1	Front	Rear*	2.39:1
Second	D or 2	Front	Front	1.45:1
Third	D	Front & Rear	None	1.00:1
Reverse	R	Rear	Rear	2.09:1

*1 range only. D Planet Carrier held by one-way clutch.

OVERHAUL CHECKS AND ADJUSTMENTS

199-232 and 304 CID Engines

Transmission End Play	.009"-.032"
Available selective thrust washers	.062"-.080"
Rear Clutch Plate Inspection for "Dish"	.010"-.015"
Planetary Pinion End Play	.010"-.020"

TORQUE—FOOT POUNDS

199-232 and 304 CID Engines

Converter to Drive Plate Cap Screws	35
Transmission Case to Converter Housing	20
Rear Extension to Case	35
Oil Pan to Case	15
Front Servo to Case	12
Front Servo Self Adjusting Bracket Screws	22*
Rear Servo to Case	20
Pump Adapter to Front Pump Housing	20
Pump Adapter to Case	15
Rear Case Adapter to Case	75*
Center Support to Case	20
Manual Shaft Lock Nut	11
Front Servo Adjusting Screw Lock Nut	23
Rear Servo Adjusting Screw Lock Nut	30
Valve Body Screws No. 10-24 N.C.	25*
Valve Body to Case 1/4-20 N.C.	75*
Oil Screen 1/4-20 N.C.	75*
Governor Valve Body to Counter Weight	75*
Governor Valve Body Cover to Governor	25*
Case Line Pressure Plug	10

*Inch Pounds

TRANSMISSION POWER FLOW AND RATIOS

360-390 CID Engines

Gear	Selector Lever Position	Clutch Applied	Band Applied	Gear Ratio
Neutral	N	None	None	
First	D or 1	Front	Rear*	2.40:1
Second	D or 2	Front	Front	1.467:1
Third	D	Front & Rear	None	1.00:1
Reverse	R	Rear	Rear	2.00:1

1 range only. D Planet Carrier held by one-way clutch.

OVERHAUL CHECKS AND ADJUSTMENTS

360-390 CID Engines

End Play	.010" to .029"
Available selective thrust washers	.062"
	.068"
	.075"
	.082"
Rear Clutch Plate Inspection for "Dish"	.010"-.020"
Planetary Pinion End Play	.010"-.020"
Converter Housing Bore Run-out	.010"
Converter Housing Face Run-out	.007"

TORQUE—FOOT POUNDS

360-390 CID Engines

Converter to Flex Plate	35
Converter Housing to Engine	28
Transmission to Converter Housing	55
Case Line Pressure Plug	15
Front Pump Assembly to Pump Body	20
Front Pump Assembly to Transmission Case	20
Manual Control Lever to Manual Control Shaft	45
Center Support to Transmission Case	25
Front Servo Adjusting Screw Locknut	20
Front Servo to Case	35
Front Servo Self Adjusting Bracket Screws	22*
Rear Servo to Case	45
Extension to Case	35
Valve Body Screws	30*
Upper Valve Body, Lower Valve Body & Cover, Bolts	10
Valve Body to Transmission	10
Oil Screen to Valve Body Screws	30*
Governor Body to Counter Weight	75*
Vacuum Control Unit to Case	15
Oil Pan to Case	15

*Inch Pounds

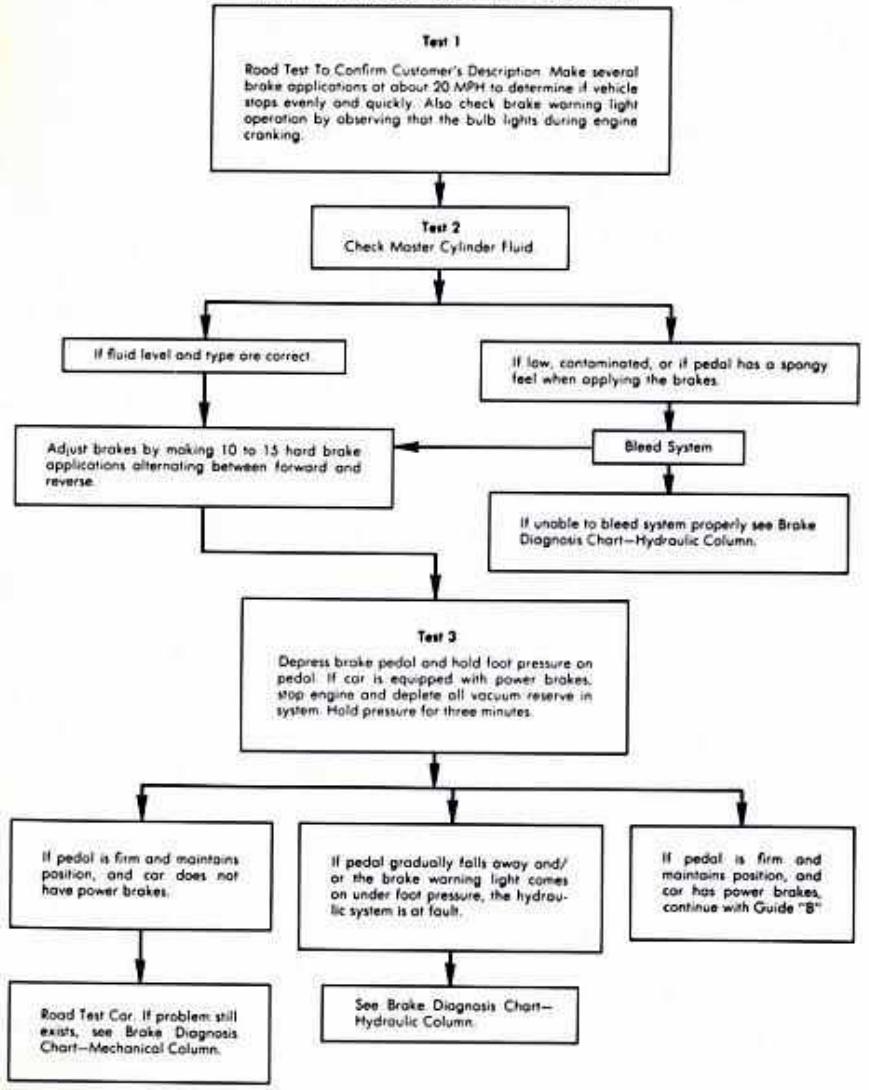
DIAGNOSIS GUIDE

In most instances, the customer will describe the difficulty as one or more of the conditions listed in the brake diagnosis guide. Road test the car with the customer to confirm the difficulty and obtain additional information which will be helpful.

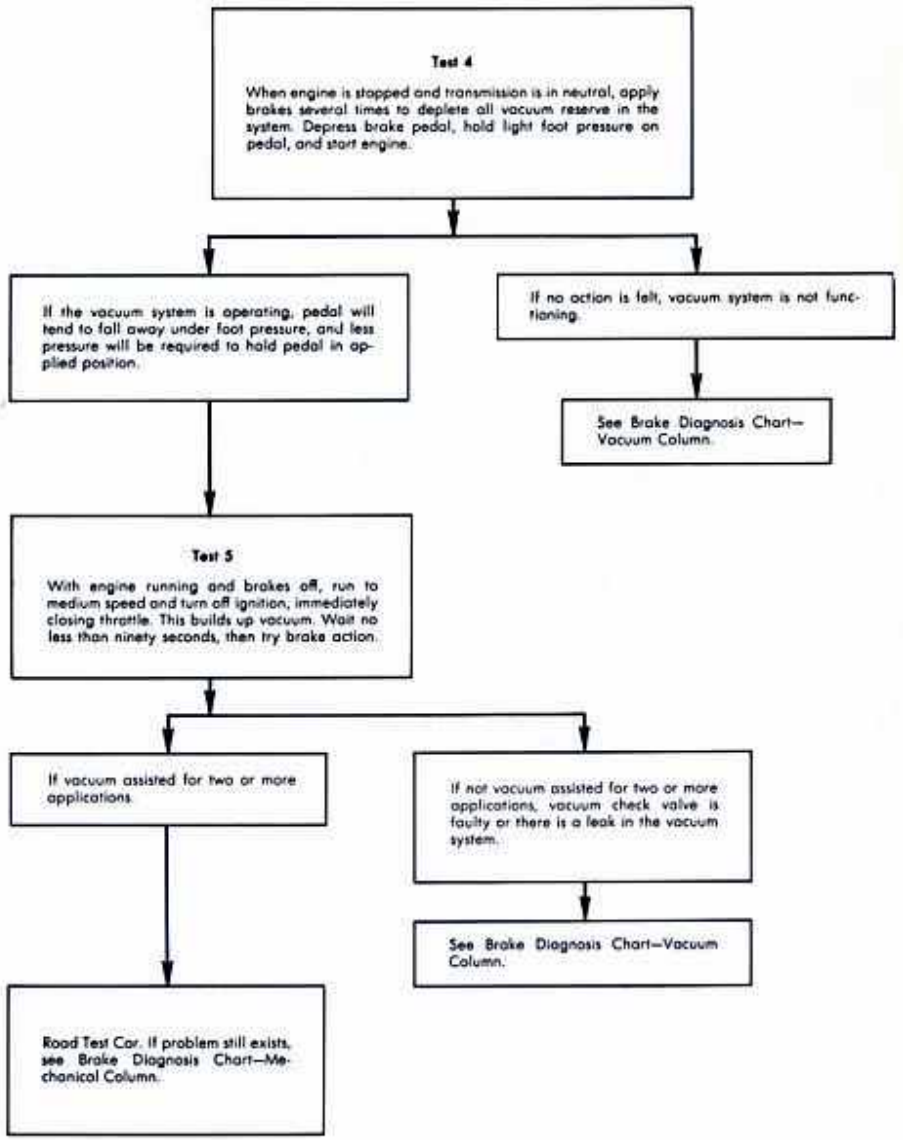
The following diagnosis guide is a sequential procedure to aid in determining the cause of a brake problem.

Guide "A" is to be used for all cars and Guide "B" is to be used for cars equipped with power brakes after completing the steps outlined in guide "A."

BRAKE DIAGNOSIS GUIDE "A"—ALL TYPES



BRAKE DIAGNOSIS GUIDE "B"—POWER BRAKES ONLY



BRAKE DIAGNOSIS CHART

CONDITION	MECHANICAL	HYDRAULIC	VACUUM (Power Unit)
LOW PEDAL (Excessive Pedal Travel to Apply Brakes)	F G I M f g	T	k
SPONGY PEDAL (A Springy Sensation of Pedal Upon Application)	I	P Q U	
HARD PEDAL (Excessive Pedal Pressure Needed to Stop Vehicle)	A F G K V o	R T U W	c e h k
FADING PEDAL (A Falling Away of Pedal Under Steady Foot Pressure)	I	P Q S T W	
GRABBING OR PULLING	A D E G H I K L N V X Y Z o	R W	k
NOISE (Squealing, Clicking or Scraping Noise)	F G H I J L M N		
CHATTER OR SHUDDER (May be Accompanied by Brake Roughness or Pedal Pumping)	D G I L N O		
DRAGGING BRAKES (Slow or Incomplete Release of Brakes)	A B C F G H K L V a f g	R U T W	k

A — Pedal linkage — binding. (Check by bleeding one wheel cylinder using light pedal effort. Observe for smooth full travel of pedal).
B — Parking brake cables and linkage sticking, dirty or corroded.
C — Parking brake improperly adjusted (Too loose or too tight).
D — Wheel Bearings loose.
E — Front Wheel alignment or uneven tire tread.
F — Brake Shoes improperly adjusted. Automatic adjuster parts — corroded, distorted or broken.
G — Brake linings or disc pads worn, contaminated or distorted.
H — Shoe return spring — weak, broken, improperly installed.
I — Drums — cracked, thin (beyond .060" of original specification) scored, hard spotted, or out of round.
J — Missing or misaligned anti-noise spring (10" non-servo brake) or weak shoe hold-down springs.
K — Brake Support Plate ledges — rusted, or grooved.
L — Support Plate — loose, worn, or distorted.
M — Disc brake — pad knock back (loose or worn wheel bearings or steering parts).
N — Caliper — not aligned with disc or loose.
O — Disc — Excessive lateral runout. Excessively out of parallel.
P — Hydraulic system fluid — Air in system, improper quality (low boiling point).
Q — Hoses and lines — soft or weak (expanding under pressure).
R — Hoses and lines — kinked, collapsed, dented, or clogged.
S — Hoses and lines — loosely connected, ruptured, or damage (causing leakage).
T — Master cylinder — primary cup worn or damaged, bore worn, rough, corroded.
U — Master cylinder — check valve faulty, or compensator port blocked.
V — Wheel or caliper cylinder pistons — frozen or seized.
W — Wheel or caliper cylinders — cups swollen, worn or damaged seals, bores rough or corroded.
X — Wheel or caliper cylinders mismatched (Size).
Y — Check tire pressure.
Z — Rear wheels (both) grabbing. Rear brake line proportional valve defective — replace.
a — Power unit valve rod linkage binding.
c — Vacuum lines — loose, broken, collapsed. Engine vacuum low.
e — Vacuum check valve — defective — sticking.
f — Power unit hydraulic push rod improperly adjusted.
g — Air trapped in hub cavity of master cylinder — inspect and remove master cylinder boot if installed.
h — Air filter — dirty, clogged.
k — Corrosion or lack of lubrication in power cylinder. Control Valve, power cylinder, piston or diaphragm defective.

BRAKE LINE PRESSURE DIFFERENTIAL WARNING LIGHT SWITCH

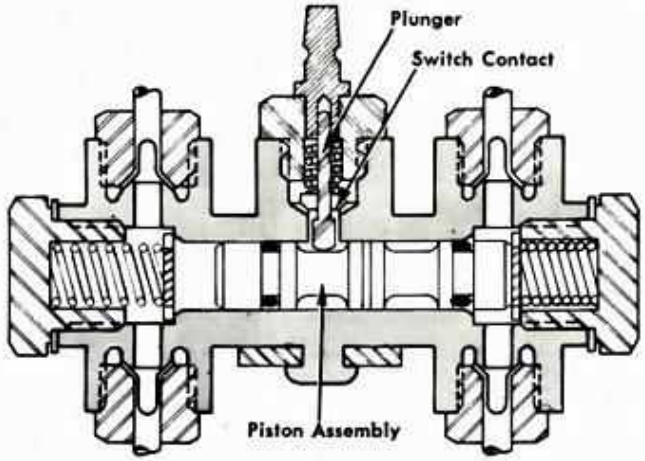
A warning light is located on the instrument cluster to warn the driver when a differential of 80 to 150 P.S.I. exists between the front and rear brake systems.

NOTE: WHEN THE IGNITION SWITCH IS TURNED TO THE START POSITION, THE WARNING LIGHT WILL LIGHT. THIS FEATURE IS INCORPORATED TO ASSURE THE DRIVER THE WARNING LIGHT BULB IS OPERATING.

A hydraulically actuated warning light switch is attached to the engine compartment side of the dash panel below the blower housing. Both front and rear brake systems are connected to the valve switch assembly.

The valve assembly consists of two valves in a common bore that are spring loaded toward the centered position. The spring loaded switch contact plunger rests on top of the valves in the centered position.

When a pressure differential of 80 to 150 P.S.I. occurs between the front and rear brake systems, the valves will shuttle toward the side with the low pressure. The spring loaded switch plunger is "triggered" and the ground circuit for the warning light is completed lighting the light.



Warning Light Switch Assembly—Actuated by Pressure

Once the switch plunger has been triggered by a pressure differential, the warning light will remain "on" when the ignition switch is turned "on."

The hydraulic brake problem must then be corrected and the warning light "reset."

Prior to correcting a brake system problem, or bleeding the brakes, disconnect the switch terminal wire and remove the nylon switch terminal, contact plunger actuating spring, and nylon plunger (with contact).

NOTE: In the event the valve was "triggered," the valve centering spring pressure may hold the switch plunger. Therefore, apply a slight amount of brake pressure while releasing the plunger from the valve body.

If the valve has been triggered, the plunger will be cocked in the bore. By observing the direction the plunger is leaning, it can be determined whether the failure is in the front or rear system. The top of the plunger will point to the side which has the low pressure.

After correcting the hydraulic system problem and bleeding the brakes, assemble the plunger spring on the plunger and install in the valve with the contact down.

Install the nylon terminal and connect the warning light wire to the valve terminal.

NOTE: In the event hydraulic brake fluid leaks from the center terminal valve body opening when the terminal is removed, replace the valve assembly.

REAR BRAKE PROPORTIONING VALVE

A rear brake proportioning valve is used on all cars equipped with Disc Brakes. The valve is located in the rear brake hydraulic line and is fastened to the body side sill forward of the rear axle.

Both the front and rear brakes receive full master cylinder pressure up to 200 P.S.I. on Hornet, AMX and Javelin Series and 400 P.S.I. on Rebel and Ambassador Series. At higher pressures, the proportioning valve regulates the pressure to the rear wheel brake units.

NOTE: The 200 P.S.I. proportioning valve used on Hornet, AMX and Javelin Series identified by a daub of blue paint and is not interchangeable with the 400 P.S.I. proportioning valve used on Rebel and Ambassador Series, identified by daubs of black and white paint.

Rear Brake Proportioning Valve

Any failure of the valve mechanism will cause only an early rear wheel slide. The proportioning valve is serviced as an assembly and never adjusted or overhauled.

FRONT WHEEL BEARING ADJUSTMENT

FRONT WHEEL BEARING END PLAY CLEARANCE ..... Zero

To adjust the wheel bearings, tighten the spindle nut to 20 Foot pounds torque while rotating the wheel to seat the bearings. Then loosen the spindle nut 1/3 turn and, with the wheel rotating, retorque the spindle nut to 12 Inch Pounds torque. Place the nut retainer on the spindle nut with the slots of the retainer aligned with the cotter pin hole on the spindle. Install cotter pin and dust cap.

TORQUE LIMITS—FOOT POUNDS

Disc Brake Caliper to Mounting Bracket Screw	95
Disc Brake Caliper Housing Screw	105
Front Brake Support Plate Screw Nut	65
Rear Brake Support Plate Screw Nut	35
Wheel to Hub Nut	75
Rear Hub to Axle Shaft Nut	250 (Min.)

BRAKE USAGE CHART

Series/Engine	9" Bendix Plain Drums	10" Bendix Flare-Flanged Drums	10" Bendix Cross Ribbed Drums
01 All 6 Cylinder	X		
01 All V-8		X	
10 All 6 Cylinder		X	
10 Sedan V-8		X	X
10 Wagon V-8			X
30-70 All V-8		X	
70 All 6 Cylinder	X		
80 All 6 Cylinder		X	
80 All V-8			X

Master Cylinder Bore (All)—1.000"
Master Cylinder Bore Clearance—.001"-.003"
Maximum Drum Diameter—9"-9.060"
10"-10.060

Disc Diameter—11-3/16"
Disc Thickness—.500" (.450" Min.)

TIRE SIZE

	Model	Standard	Optional
01 Series	Sed. 6 Cyl.	6.45 × 14	B 78 × 14 C 78 × 14
01 Series	Sed. V-8	C 78 × 14	D 78 × 14 D 70 × 14
10 Series	Sed. & Hardtop	E 78 × 14	E 60 × 15 F 78 × 14
	Station Wagon	G 78 × 14	H 78 × 14
30 Series		E 78 × 14	E 70 × 14
70 Series	6 Cylinder	C 78 × 14	D 78 × 14 E 70 × 14
70 Series	V-8	D 78 × 14	E 70 × 14
80 Series	Sed. & Hardtop	F 78 × 14	G 78 × 14
	V-8 Station Wagon	H 78 × 14	

TIRE INFLATION PRESSURES

Recommended Tire Inflation Pressures—Pounds Per Square Inch (Cold)
Do Not Reduce Tire Pressure If Tires Are Warm

Model	Standard Inflation for up to and Including Full Loads		Optional Inflation for Reduced Loads	
	Front	Rear	Front	Rear
01 Series with Standard Sized Tires	26*	28	24*	24
01 Series with Oversized Tires	24	24	24	24
30 Series—All	24	24	24	24
70 Series—6 Cylinder	24	24	24	24
70 Series—V8	24*	24	24*	24
10 Series—6 Cylinder Sedan	24	28	24	24
10 Series—V8 Sedan	28	28	26	26
10-80 Series—Station Wagon	20	28	20	28
80 Series—Sedan	24	28	24	24

*With Air Conditioning add 2 PSI to front tires.

For sustained speeds over 75 MPH; add 4 PSI to the recommended pressures above. Do not exceed 32 PSI.

Tire Loading, Selection and Pressure.

The original equipment tires are designed and thoroughly tested to meet all normal operating requirements within the vehicle capacity (including full-load service) when inflated to pressures listed in the table.

The inflation table shows the recommended tire pressures for average service up to five-passenger load and also the tire pressures for use at full-load service conditions. When properly inflated, the original equipment, standard-size tires will give satisfactory service for full-load conditions with passengers and luggage, which is listed (below) for each series.

Full-Load Service of the Car Is:

(each passenger is considered 150 lbs.)

Hornet	
All Models: 925 lbs.	3 passengers, front seat 2 passengers, rear seat 175 lbs. luggage
AMX	
All Models: 500 lbs.	2 passengers, front seat 200 lbs. luggage
Javelin	
All Models: 800 lbs.	2 passengers, front seat 2 passengers, rear seat 200 lbs. luggage
Rebel and Ambassador	
All Models Except Station Wagons: 1100 lbs.	3 passengers, front seat 3 passengers, rear seat 200 lbs. luggage
2-Seat Station Wagons: 1200 lbs.	3 passengers, front seat 3 passengers, rear seat 300 lbs. of luggage
3-Seat Station Wagons: 1200 lbs.	3 passengers, front seat 3 passengers, second seat 2 passengers, third seat or 300 lbs. luggage

NOTE: Station Wagon roof rack luggage should be limited to 150 lbs. evenly distributed included in above capacity.
When towing trailers, the allowable passenger and cargo load must be reduced by an amount equivalent to the trailer tongue load.

Optional oversize tires are available for extra service life. When continued full-load service is anticipated, these optional tires provide increased tread life to cope with the more severe operating conditions. For these special conditions, the tires should be inflated to the same pressures as shown in the inflation table. The stated full-load service capacity of the vehicle should not be exceeded.

For cars driven at sustained high speeds, as on a trip, tire pressures should be increased as noted below the tire inflation table. These pressures will improve fuel economy under all driving conditions with some sacrifice in riding quality.

To achieve optimum riding smoothness, it is suggested that tire pressures be set at reduced load pressures for conditions up to and including five-passenger loads without luggage, and at speeds under 75 MPH.

Belted Bias Ply Tires

Because of the design features of belted bias ply tires, the ride characteristics vary somewhat from conventional tires.

The handling characteristics also differ from those of conventional tires and for this reason belted bias ply tires should be used only in complete sets and not matched with conventional tires.

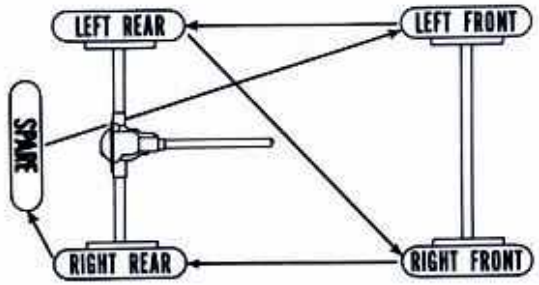
Tire Condition

Check tires often for visible under-inflation and for signs of uneven wear, which may indicate need for front-end alignment and/or wheel balancing, which are suggested services at 6,000 mile intervals.

As a further visible check of tire condition and wear, a tread wear indicator is molded into the bottom of the tread grooves. This indicator will appear as several 1/2-inch-wide bands across the tread when 1/16-inch tread depth remains.

In accordance with the diagram, rotating tires every 6,000 miles is recommended to assure longer overall tire life by equalizing wear.

If no spare tire is used, move right rear to left front and follow balance of diagram.



REAR AXLE

REAR AXLE TESTING AND DIAGNOSIS

The action of transmitting engine torque through a 90 degree turn to drive the rear wheels will produce some noise in the rear axle.

The first important step in diagnosing an alleged rear axle noise condition is to obtain a complete description of the noise and driving conditions when the noise occurs. Slight axle noises that are confined to a short speed range or to a specific period are considered normal. Therefore, road test the car with the customer for a demonstration of the complaint condition, wherever possible.

Noises produced by the engine, transmission, tires, wheel bearings, exhaust system, propeller shaft, or the action of wind on the body or grille may be incorrectly diagnosed as originating from the rear axle. Therefore, it is necessary to thoroughly test to isolate the trouble to a specific unit of the car.

Rear axle noise conditions are usually related to car speed rather than engine RPM or transmission gears. Tests should be performed using different engine, transmission gear and car speed combinations to "pin-point" the unit affected.

Rear Axle Testing

Prior to road test check the tire pressure and the rear axle lubricant level.

Drive the car a sufficient distance to warm the axle to the required operating temperature.

With the car stopped and the transmission in neutral, run the engine at various speeds. If the noise condition is heard during this test, the noise is confined to the engine, exhaust system, clutch, transmission or engine driven accessory equipment.

Tire Noise Tests

Some types of tire tread wear or tread patterns may produce objectionable noises. Therefore, drive the car on various types of road surfaces and listen for a change in the noise. If the noise varies with the types of surfaces the tires may be the cause.

Wheel Bearing Tests

Worn, loose, or damaged wheel bearings may be confused with axle noise. Wheel bearing noise is usually more noticeable when coasting at lower car speeds. Gently applying the brakes will usually change wheel bearing noise. Another test is to turn the car alternately left and right which side loads the bearings and causes the defective bearing to become noisy.

Rear Axle Tests

Rear axle noises may be classified into two types: gear noise and bearing noise.

Gear noise is recognized as a whine or high pitched resonating sound more pronounced at certain speeds and usually within a narrow speed range under a drive (accelerating load), coast, or float (maintained speed) condition.

Axle bearing noise is usually constant and the pitch related to the car speed.

The drive pinion turns faster than the drive gear; therefore, the drive pinion bearings will be a higher pitch than the differential bearings. The drive pinion bearings are usually heard at low car speeds (20-30 MPH).

The differential bearings are lower in pitch because they are turning at the same speed as the wheels when the car is driven straight ahead. Differential bearing noise will not vary when the car is turned alternately left or right nor when the brakes are gently applied.

Rear Axle Backlash

Rear axle backlash must be isolated from worn universal joints, or a loose fit of universal joint on the transmission splines.

Rear axle backlash may be due to excessive clearance between the differential gear and differential pinion or a loose fitting differential pinion shaft in the case.

Excessive drive gear and drive pinion clearance will also cause excessive backlash. However, a gear noise will usually be present due to an improper drive gear and drive pinion adjustment.

Other Axle Conditions

A knocking or "clucking" noise heard at low speed when coasting may be caused by a loose fitting differential gear in the differential case bore. When this condition is encountered, lightly applying the brakes usually will reduce the sound.

Differential gear noise heard only under certain conditions such as; when spinning a rear wheel for on-the-car wheel balancing or when a rear wheel is spinning due to icy conditions is considered normal.

When a noise has been determined to be caused by the bearings, the gears do not require replacement unless an inspection reveals signs of obvious damage.

When the noise is determined to be caused by the drive pinion and drive gear at low mileages the need for bearing replacement is dependent upon inspection of the bearings during overhaul.

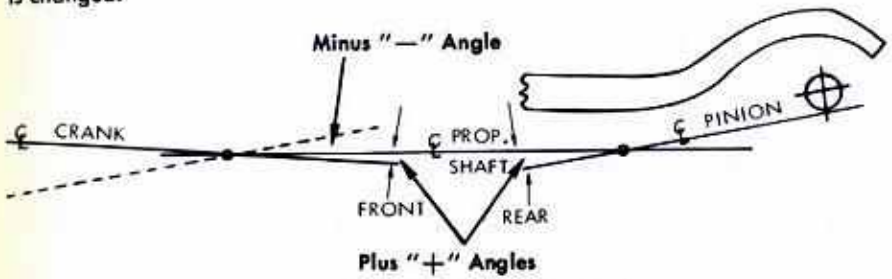
UNIVERSAL JOINT ANGLES

10-80 SERIES

When universal joints operate at an angle, the driven yoke rotation speed will fluctuate even though the driving yoke speed is constant. The driven yoke will speed up and slow down twice each revolution. This fluctuation in speed is proportional to the operating angle of the universal joint, the greater the angle, the greater the fluctuation.

Therefore, the operating angles of the two universal joints on the propeller shaft must be controlled to minimize this effect. A wide difference of angles will result in a vibration of the driveline.

Universal joint angles must be inspected when excessive vibration is encountered, the engine mounts changed, or the rear suspension upper control arm crossmember is changed.



Front and Rear Universal Joint Angles

REAR AXLE

When the included angles illustrated are below the propeller shaft center line the angles are considered to be positive (+).

When the included angle illustrated is above the propeller shaft center line the angle is considered to be negative (—). Negative angles must be avoided.

The difference in the readings taken at the drive pinion yoke and the front propeller shaft yoke is the rear universal joint angle and should be 1½° to 3¼° (2¼° desired). The difference in the readings taken at the front propeller shaft yoke and the transmission yoke is the front universal joint angle and should be +1°. For detailed service information refer to "REAR AXLE—PROPELLER SHAFT" section of the Technical Service Manual.

REAR AXLE RATIOS AND APPLICATION

Series	Engine CID	Transmission Type	Rear Axle 7-9/16"	Rear Axle 8⅝"	Ratios STD.	Ratios OPT.
01	199,232 1V	3 Speed Man. Automatic	X		3.08:1(13/40)	3.31:1(13/43)
01	232 1V	Automatic	X		2.37:1(19/45)	2.73:1(15/41)
01	304 2V	Automatic		X	2.87:1(15/43)	3.15:1(13/41)
10	232 1V	3 Speed Man.		X	3.15:1(13/41)	3.54:1(11/39)
10-80	232 1V	Automatic		X	3.15:1(13/41)	
80	232 2V	Automatic		X	3.15:1(13/41)	3.54:1(11/39)
10-80	304,360,390	Automatic		X	2.87:1(15/43)	3.15:1(13/41)
10	2V or 4V 360,390 4V	4 Speed Man.		X	3.54:1(11/39)	3.15:1(13/41)
10 "Machine"	390 4V	4 Speed Man.		X	3.54:1(11/39)	3.91:1(11/43)
		Automatic		X	3.54:1(11/39)	3.15:1(13/41)
30-70	360,390 4V	Automatic		X	2.87:1(15/43)	3.15:1(13/41)*
30-70	360,390 4V	4 Speed Man.		X	3.54:1(11/39)	3.15:1(13/41)
70	232 1V	3 Speed Man. Automatic	X		3.08:1(13/40)	3.31:1(13/43)
70	304 2V	3 Speed Man.		X	3.15:1(13/41)	3.54:1(11/39)
70	304,360 2V	Automatic		X	2.87:1(15/43)	3.15:1(13/41)*

***With optional "Performance Group" standard and optional ratios are reversed. Dealer Installed Performance Ratios: 3.73, 3.91, 4.10, 4.44 and 5.00.**

REAR AXLE ADJUSTMENT

	01—199-232 CID 70—232 CID	10-80—232 CID All 304-360 CID
Drive Pinion Bearing Preload	15-25 In. Lbs.	17-28 In. Lbs.
Type of Adjustment	Collapsible Sleeve	Collapsible Sleeve
Differential Bearing Preload	.008"	.008"
Type of Adjustment	Shims	Shims
Drive Gear to Drive Pinion Backlash	.005"-.009" (.008" Desired)	.005"-.009" (.008" Desired)
Type of Adjustment	Shims	Shims
Differential Case Flange Run-Out (Drive Gear Flange) Inspection Only—No Adjustment	.002" Total	.002" Total
Differential Gear to Case Clearance	.000"-.008"	.000"-.008"
Preload	0-60 Inch Pounds	0-180 Inch Pounds

Type of Adjustment	Oversize Thrust Washers	Oversize Thrust Washers
Axle Shaft End Play	.004"-.008" (.006" Desired)	.004"-.008" (.006" Desired)
Type of Adjustment	Shims	Shims

TORQUE TIGHTENING SPECIFICATIONS —FOOT POUNDS

	01—199-232 CID 70—232 CID	10-80 (232) All 304-360-390
Rear Axle Housing Cover Screws	15	15
Rear Brake Support Plate	35	35
Rear Spring "U" Bolts	60	
Rear Spring Shackle Bolts (9/16"-18")	50	
Rear Spring Shackle Bolts (3/8"-24")	30	
Rear Hub to Axle Shaft Nut (Min.)	250	250 (Min.)
Differential Bearing Cap	60	90
Drive Gear to Case Screw	50	80
Drive Pinion Nut	190	
Wheel to Hub Nut	75	75
Rear Universal Joint "U" Bolts	15	15 (150 In. Lbs. with adapter)
Rear Axle Control Arms (10-80)		60
Rear Axle Control Arm Crossmember Bolts (10-80)		75
Rear Axle Drive Pinion Yoke Nut	65	
"Twin-Grip" Case Screws	24	40

STEERING—FRONT SUSPENSION

FRONT WHEEL ALIGNMENT SPECIFICATIONS

Turning Angle	
Inside Wheel	25°
Outside Wheel	22°
Caster Angle	
Without Power Steering	−1/2° to + 1/2°
With Power Steering	+1/2° to +1-1/2°
Camber	−3/8° to +3/8°
Toe-In	1/16" to 3/16"—1/8" Total desired

ADJUSTMENTS

Manual Steering Gear Adjustments—
Pitman Arm Disconnected—Measured in Pounds Pull at Steering Wheel

	01-30-70	10-80
Worm Bearing Preload (One Turn from Straight Ahead)	1/4—5/8	1/8—3/8
Pitman Shaft Mesh (Straight Ahead-Gear on High Point)	7/8—1-1/8	3/4—1-1/8

FRONT WHEEL BEARING ADJUSTMENT

Front Wheel Bearing End Play Clearance	Zero

To adjust the wheel bearings, tighten the spindle nut to 20 Foot pounds torque while rotating the wheel to seat the bearings. Then loosen the spindle nut 1/3 turn and, with the wheel rotating, retorque the spindle nut to 12 Inch Pounds torque. Place the nut retainer on the spindle nut with the slots of the retainer aligned with the cotter pin hole on the spindle. Install cotter pin and dust cap.

TORQUE LIMITS—FOOT POUNDS

	All Series
Steering	
Idler Arm Nut	55
Idler Arm Bracket to Sill Bolt Nut	45
Pitman Arm Nut	115
Tie Rod Adjusting Clamp Screw Nut	10
Tie Rod Ball Joint Nut	35
Steering Wheel Nut	20
Gear to Adapter and Side Sill Bolts	60
Flexible Coupling Bolt Nuts	20
Flexible Coupling Pinch Bolt	30
Manual Steering Gear	
Pitman Shaft Adjusting Screw Lock Nut	25
Cover and End Plate Attaching Screws	35
Worm Bearing Adjuster Lock Nut	85
Power Steering Gear	
Pressure and Return Hose Fittings	25
Pitman Shaft Adjusting Screw Lock Nut	35
Side Cover Bolts	30
Adjuster Plug Lock Nut	80
Return Guide Clamp Screws	10
Power Steering Pump Belt Adjustment	
Use Belt Adjustment Gauge J-7316	
New Belt	125-145
Belt With Previous Service	90-110
Vane Type Pump	All 6 Cyl.
Mounting Studs to Reservoir	35
Union to Reservoir	35
Roll Type Pump	All V-8
Pump Body to Cover Screws	25
Flow Control Valve Cap	35
Reservoir to Pump Body Bolt	35
Reservoir Cover Attaching Stud	5
Pulley Screw	20
Suspension	
Crossmember Bolt or Stud Nut	65
Shock Absorber Nut Upper	30

Shock Absorber Lower Nut	8
Spindle to Support Plate Bolt Nut	65
Sway Bar Bracket	25
Sway Bar Link to Control Arm	8
Lower Control Arm	
Strut Rod Bracket Bolt Nut	55
Strut Rod to Cushion Nut	85
Strut Rod Bolt Nut	65
Ball Joint Nut	45
Eccentric Bolt Nut	95
Upper Control Arm	
Inner Pivot Bolt Nut	55
Ball Joint Stud Nut	40
Energy Absorbing Steering Column	
Bracket Mounting Bolts to Plate Welded on Column	15
Instrument Panel Bracket Rear Stud Nuts	10
Instrument Panel Bracket Front Bolt or Stud Nut	10

PROTECTIVE MAINTENANCE

American Motors Protective Maintenance and Lubrication recommendations have been developed to provide the owner with optimum performance of his car and maximum protection under reasonable driving conditions.

The intervals at which the various lubrication and maintenance services should be performed are detailed in the Mechanical Maintenance Schedule provided with each car. The Maintenance Schedule is designed to advise the owner of what is expected of him in continuance of the quality performance designed and engineered into his American Motors Product and also outlines the maintenance required for warranty validity.

The Maintenance Schedule will aid American Motors Dealers and Service Technicians in serving the owner's needs at the recommended intervals.

Information concerning the types of lubricants specified, the quantities required, and the location of various points of application are listed and consolidated in this section.

Detailed service procedures and specifications are listed in the respective sections of the Technical Service Manual.

Maintenance service is service that is required through everyday driving of any car—engine or transmission tune-ups, minor adjustments beyond 6,000 miles, lubrication . . . service or repairs for any reason other than defects covered by the Warranty. Maintenance services are specified by the American Motors Engineering Staff. Some are required for best operation on a mileage or time basis, as outlined in the Mechanical Maintenance Schedule.

The services outlined are those which experience and testing have indicated are the most likely needed, at the intervals shown. Protective Maintenance, performed at regular intervals, is the key to long and trouble-free car life.

The Mechanical Maintenance Schedule on the following pages will serve as quick reference to the periodic maintenance and lubrication intervals recommended for American Motors vehicles.

American Motors Mechanical Maintenance Schedule for 1970 Cars

SERVICES SCHEDULED BY MILEAGE or TIME INTERVALS

CHANGE ENGINE OIL AND INSTALL NEW OIL FILTER	Required (R) every 6,000 miles or 6 months, whichever occurs first, under normal driving conditions. (See chart 1)
REPLACE ENGINE COOLANT	Required (R) after first 24 months, and every 12 months thereafter.

SERVICES SCHEDULED BY ACCUMULATED MILEAGE

R – Required (by American Motors) in normal use and service.
E or (E) – Required (by U.S. Government) in all types of use and service, each 12,000 miles, for compliance with U.S. national emission control standards.
HD – Required (by American Motors), in addition to (or as a substitute for) certain "R" services, in heavy-duty use and service, or under certain special driving conditions.
O – Optional in all types of use and service, but important to highway safety or basic driving satisfaction.

ODOMETER READING 60000 IN THOUSANDS

		6	12 36 60	18 30 42 54 66	24 48 72
Engine Oil Filler Cap *(filter type)*–clean	(E)	R	R	R	R
Fluid Levels *(including battery)*–inspect and correct	(a)	R	R	R	R
Heat Valve *(exhaust manifold)*–inspect and lubricate	(E)	R	R	R	R
Drive Belts *(condition and tension)*–inspect and correct	(E)	R	R	R	R
Carburetor Air Cleaner Element – clean	(E)	R	R	R	
Carburetor Air Cleaner Element – replace	(E)		HD		R
PCV Valve–replace	(E)		R		R
PCV Filter (6 cylinder)–clean	(E)		R		R
Fuel Filter Element–replace			R		R
Manual Transmission–verify clutch adjustment		R	R		R
Automatic Transmission – adjust rear band		R			
Automatic Transmission – complete tune-up	(b)	HD	HD		R
COMPLETE CHASSIS LUBRICATION (see chart 2)			HD		R
U.S. EMISSION CONTROL SERVICES (see chart 3)			E		E
Brakes *(lining condition and parts)*–inspect			O		O
COMPLETE BODY LUBRICATION (see chart 4)			O		O
Front Suspension–align			O		O
Tire Pressure–verify to specifications		O	O	O	O
Tires – balance		O	O	O	O
Tires – rotate		O	O	O	O
Factory Recommended Road Test *(performance and handling)*		O	O	O	O

a. Check engine oil level at each gasoline fill.

b. An automatic transmission tune-up should be purchased whenever questionable transmission performance is evident from your driving or dealer road test.

American Motors Mechanical Maintenance Schedule for 1970 Cars

1. ENGINE OIL AND OIL FILTER CHANGE

NORMAL – Nearly all trips over 5 miles in Summer and 10 miles in Winter:
Change oil & filter every 6,000 miles or 6 months, whichever occurs first.

SPECIAL – See description below to be sure you comply with maintenance requirements:
Change oil & filter ever 2,000 miles or 2 months, whichever occurs first.

Summer–most trips less than 5 miles.

Winter (below 32° average)–most trips less than 10 miles.

Heavy-Dust Conditions.

Operation for extended idling periods.

Towing Trailers over 2,000 pounds.

2. COMPLETE CHASSIS LUBRICATION

EVERY 24,000 MILES (or every 12,000 miles for severe dust or wet driving conditions)

Inspection and lubrication of . . .

- Front suspension ball joints (with replacement of suspension and steering system seals as necessary)
- Front wheel bearings
- Clutch levers and linkage
- Turning radius stop plate and bracket

3. U.S. EMISSION CONTROL SERVICES

EVERY 12,000 MILES

- (E) Items (above)
- Carburetor–inspect and adjust choke; adjust idle speed and mixture to specifications
- Spark Plugs–inspect, clean and re-gap (replace if required)
- Ignition Points, Coil and Spark Plug Wires –inspect (replace if required)
- Distributor Cam Lubricator rotate at 12-36-60,000 miles replace at 24-48-72,000 miles
- Ignition Timing–check and set to specifications
- Deceleration Vacuum Advance Valve – check and set to specifications
- Distributor Vacuum Advances – check
- Air-Guard Hose Connections (V-8, manual transmission) – inspect
- Fuel Tank Vapor Emission Control System – inspect Liquid Check Valve and hose connections (for California cars)

4. COMPLETE BODY LUBRICATION

EVERY 12,000 MILES

- Hood latch and hinges
- Door latches, lock cylinders and door hinges
- Trunk lid (or tailgate) hinges and latches
- Front seat tracks
- Ash tray slides
- Glove box door latch and hinge
- Courtesy light switch buttons
- Apply Silicone lubricant to all door, window, trunk (or tailgate) rubber-weather seals

ENGINE OIL QUALITY

For maximum engine protection under all driving conditions encountered during the recommended oil change intervals shown in the chart, it is necessary to use only "MS" certified sequence-tested oils. The term "MS" must appear on the oil container singly or in conjunction with other designations. "MS" designated oils are heavy-duty detergent oils that are formulated to withstand all service conditions in modern powerplants. Engine oils designated only as "ML" and/or "MM" are not recommended and should not be used except in an emergency when "MS" oil is not available. Certified sequence-tested engine oils are described

on their containers by such phrases as: meets, exceeds, excels, or has proven superior in the test requirements, test sequences, MS Service tests, standards, and service requirements of automotive manufacturers, automakers, or car manufacturers for MS service of Service MS.

ENGINE OIL VISCOSITY

Single viscosity or multi-viscosity types of oil are equally acceptable if refined and sold by a reputable marketer. Refer to the following for oil viscosity number.

Oil viscosity number used should be determined by the lowest anticipated temperature before the next oil change period.

Lowest Temperature Anticipated	Recommended Single-Grade	Recommended Multi-Grade
Above 32° F.	SAE 20W-20	SAE 10W-30 or 10W-40
Above 0° F.	SAE 10W*	SAE 10W-30 or 10W-40
Below 0° F.	SAE 10W*	SAE 5W-20 or 5W-30

*Sustained high speeds (above 65 M.P.H.) should be avoided when using SAE 10W engine oil since oil consumption may be greater under this condition.

ENGINE OIL LEVEL

Form the habit of having the oil level checked whenever fuel is purchased. Allow the oil level to stabilize to assure an accurate check. If the oil level is down to the ADD oil mark on the oil level gauge, add one quart of oil to bring it up to the FULL mark. DO NOT OVERFILL past FULL mark. It is not unusual to expect oil additions between oil changes due to varying conditions of car usage. Crankcase capacity is 4 quarts. With filter change, capacity is 5 quarts.

OIL FILTER

A full flow oil filter is mounted on the lower front right side on V-8 Engines and on the lower center right side on Six Cylinder Models.

The throw-away filter unit can be removed from the adapter with use of Oil Filter Remover J-9614. (6 Cylinder), J-22700 (V-8). The replacement unit is turned on by hand until the gasket contacts the seat and is then tightened an additional half to full turn.

TRANSMISSION LUBRICATION

Manual

The correct oil and oil level is of utmost importance for smooth operation, proper shifting, and longevity of the unit. Avoid using non-authorized oils which may cause trouble.

The following is the recommended lubricant:

SAE 80 Gear Lubricant (3 and 4-Speed)
SAE 20W-20 Engine Oil (3-Speed)
SAE 10W-30 Engine Oil (3-Speed)
AM Automatic Transmission Fluid or "Dexron" (3-Speed)

CAUTION: Always use the recommended grade and type of oil. DO NOT MIX OILS.

"SHIFT-COMMAND" Automatic Transmission

The correct oil and oil level is of utmost importance for smooth operation, proper shifting, and longevity of the unit. Avoid using non-authorized oils which may cause trouble. American Motors oil is of the approved type. It is wise to check the sealed cans for the approved symbol "Dexron" Automatic Transmission Fluid. Refer to "Shift Command" section for detailed fluid level check procedure.

REAR AXLE LUBRICATION

"Twin-Grip" rear axle lubricant is to be used in all new assemblies or following the installation of replacement parts. After the rear axle has been run-in, an SAE #90 Gear Lubricant of API-GL-5 quality may be used. Naturally, the results of such use are the responsibility of the lubricant supplier or servicing dealer.

American Motors "Twin-Grip" Rear Axle Lubricant is to be used in all cases requiring additional lubricant or at time of other rear axle service in all "Twin-Grip" equipped rear axle assemblies. "Twin-Grip" Rear Axle Lubricant is also satisfactory for use in place of Multi-Purpose lubricants commonly used for the regular (Hypoid) rear axle.

FRONT SUSPENSION AND STEERING LINKAGE BALL JOINTS

The ball joint assemblies are to be lubricated using a low pressure manual gun with Chassis (Lithium Base) Lubricant or Multi-Purpose Chassis Lubricant.

CLUTCH IDLER LEVER INNER AND OUTER PIVOTS

01, 10, 30 and 80 Series

Remove plug and lubricate with Chassis (Lithium Base) Lubricant.
Install plug after lubrication.

01 and 70 Series (199-232)

The clutch release idler lever must be disassembled to lubricate the ball studs. Use Lithium Base Chassis Lubricant. Check clutch pedal free play after assembly.

POWER STEERING RESERVOIR

No regular drain or refill intervals recommended, only at time of overhaul or other service. Use "Dexron" Automatic Transmission Fluid or Type "A," "AQ-ATF" Suffix "A." Fill until oil level is at correct level on dip stick on Six cylinder models, 1" below top of reservoir on V-8 Models.

BRAKE MASTER CYLINDER

1/4" from top. Add or refill with SAE J-1703 (70-R-3) heavy duty hydraulic brake fluid for Standard Brakes, American Motors Part Number 8991860 for Disc Brakes.

FRONT WHEEL BEARINGS

Pack with All Purpose Lubricant.

REAR WHEEL BEARINGS

Only at time of overhaul or other service. Wheel Bearing Lubricant.

STEERING GEAR (Non-Power)

No regular drain or refill intervals recommended, only at time of overhaul or other service. Add chassis lubricant if required.

EXHAUST MANIFOLD HEAT VALVE

Use Part Number 8991632—Special Lubricant.

PARKING BRAKE LINKAGE

"Lubriplate."

ACCELERATOR LINKAGE

Engine Oil.

BODY LUBRICATION

Door & Window Weather Strips	Clean sealer rubbers. Apply silicone oil (AM. Silicone Lub. Spray).
Key-Lock Cylinders	Apply fine flaked graphite in keyhole and insert key in lock cylinder, repeat several times.
Door, Hood, Trunk & Tailgate Lock Mechanisms	Apply "Lubriplate."
Door, Hood, Trunk & Tailgate Hinge Pivots	Apply engine oil.
Glove Box Latch & Hinge	Apply "Lubriplate."
Ashtray Slides	Apply "Lubriplate."
Front Seat Adjustment Slides	Apply "Lubriplate."
Courtesy Light Switch Button	Apply "Petrolatum," "Lubriplate," on the button.

CAPACITIES

CAPACITIES	U.S.A.	British Imperial
CRANKCASE	Quarts	
All Engines	4	3.3
(Add 1 Qt. with Filter Change)		
AIR CONDITIONING REFRIGERANT		
01-30-70	2.25 lbs.	
10-80	2.75 lbs.	
COOLING SYSTEM	Quarts	
199, 232	10.5	8.7
Less Heater	9.5	7.9
304	14	11.7
Less Heater	13	10.8
360-390	13	10.8
Less Heater	12	10.0

TRANSMISSIONS		Pints
3 Speed		
T-96J, T-96H—199, 232 (01 Series)	1.5	1.25
T-14—232 (10-70-80 Series)	2.5	2.1
T-15—304 (01-10-30-70 Series)	3.0	2.5
4 Speed		
T-10—304, 360, 390 (10-30-70 Series)	2.5	2.1
Shift Command		Quarts
199, 232, 304	9.5	7.9
360, 390	10	8.3

DIFFERENTIAL		Pints
232 (01-70), 199	3	2.5
304 (01-70), 232, 304, 360, 390—(10, 80)	4	3.3

CAPACITIES	Nationwide	California
GAS TANK	Gallons	
01	19.0	16.0
30, 70	19.0	16.0
10, 80 Sedan	21.5	19.5
10 2-Seat Station Wagon	21.5	19.5
10 3-Seat Station Wagon	19.0	17.0
80 Wagons—All	19.0	17.0

DECIMAL EQUIVALENTS AND TAP DRILL SIZES

DRILL SIZE	DECIMAL	TAP SIZE	DRILL SIZE	DECIMAL	TAP SIZE	DRILL SIZE	DECIMAL	TAP SIZE
1/64	.0156		17	.1730		Q	.3320	3/8-24
1/32	.0312		16	.1770	12-24	R	.3390	
60	.0400		15	.1800		11/32	.3437	
59	.0410		14	.1820	12-28	S	.3480	
58	.0420		13	.1850	12-32	T	.3580	
57	.0430		3/16	.1875		23/64	.3594	
56	.0465		12	.1890		U	.3680	7/16-14
3/64	.0469	0-80	11	.1910		3/8	.3750	
55	.0520		10	.1935		V	.3770	
54	.0550	1-56	9	.1960		W	.3860	
53	.0595	1-64, 72	8	.1990		25/64	.3906	7/16-20
1/16	.0625		7	.2010	1/4-20	X	.3970	
52	.0635		13/64	.2031		Y	.4040	
51	.0670		6	.2040		13/32	.4062	
50	.0700	2-56, 64	5	.2055		Z	.4130	
49	.0730		4	.2090		27/64	.4219	1/2-13
48	.0760		3	.2130	1/4-28	7/16	.4375	
5/64	.0781		7/32	.2187		29/64	.4531	1/2-20
47	.0785	3-48	2	.2210		15/32	.4687	
46	.0810		1	.2280		31/64	.4844	9/16-12
45	.0820	3-56, 4-32	A	.2340		1/2	.5000	
44	.0860	4-36	15/64	.2344		33/64	.5156	9/16-18
43	.0890	4-40	B	.2380		17/32	.5312	5/8-11
42	.0935	4-48	C	.2420		35/64	.5469	
3/32	.0937		D	.2460		9/16	.5625	
41	.0960		E, 1/4	.2500		37/64	.5781	5/8-18
40	.0980		F	.2570	5/16-18	19/32	.5937	11/16-11
39	.0995		G	.2610		39/64	.6094	
38	.1015	5-40	17/64	.2656		5/8	.6250	11/16-16
37	.1040	5-44	H	.2660		41/64	.6406	
36	.1065	6-32	I	.2720	5/16-24	21/32	.6562	3/4-10
7/64	.1093		J	.2770		43/64	.6719	
35	.1100		K	.2810		11/16	.6875	3/4-16
34	.1110	6-36	9/32	.2812		45/64	.7031	
33	.1130	6-40	L	.2900		23/32	.7187	
32	.1160		M	.2950		47/64	.7344	
31	.1200		19/64	.2968		3/4	.7500	
1/8	.1250		N	.3020		49/64	.7656	7/8-9
30	.1285		5/16	.3125	3/8-16	25/32	.7812	
29	.1360	8-32, 36	O	.3160		51/64	.7969	
28	.1405	8-40	P	.3230		13/16	.8125	7/8-14
9/64	.1406		21/64	.3281		53/64	.8281	
27	.1440					27/32	.8437	
26	.1470	10-24				55/64	.8594	
25	.1495					7/8	.8750	1-8
24	.1520					57/64	.8906	
23	.1540					29/32	.9062	
5/32	.1562	10-30				59/64	.9219	
22	.1570	10-32				15/16	.9375	1-12, 14
21	.1590					61/64	.9531	
20	.1610					31/32	.9687	
19	.1660					63/64	.9844	
18	.1695					1	1.000	
11/64	.1719							

PIPE THREAD SIZES

THREAD	DRILL	THREAD	DRILL
1/8-27	R	1-1/2 11-1/2	1-47/64
1/4-18	7/16	2 11-1/2	2-7/32
3/8-18	37/64	2-1/2 8	2-5/8
1/2-14	23/32	3-8	3-1/4
3/4-14	59/64	3-1/2 8	3-3/4
1 11-1/2	1-5/32	4-8	4-1/4
1-1/4 11-1/2	1-1/2		