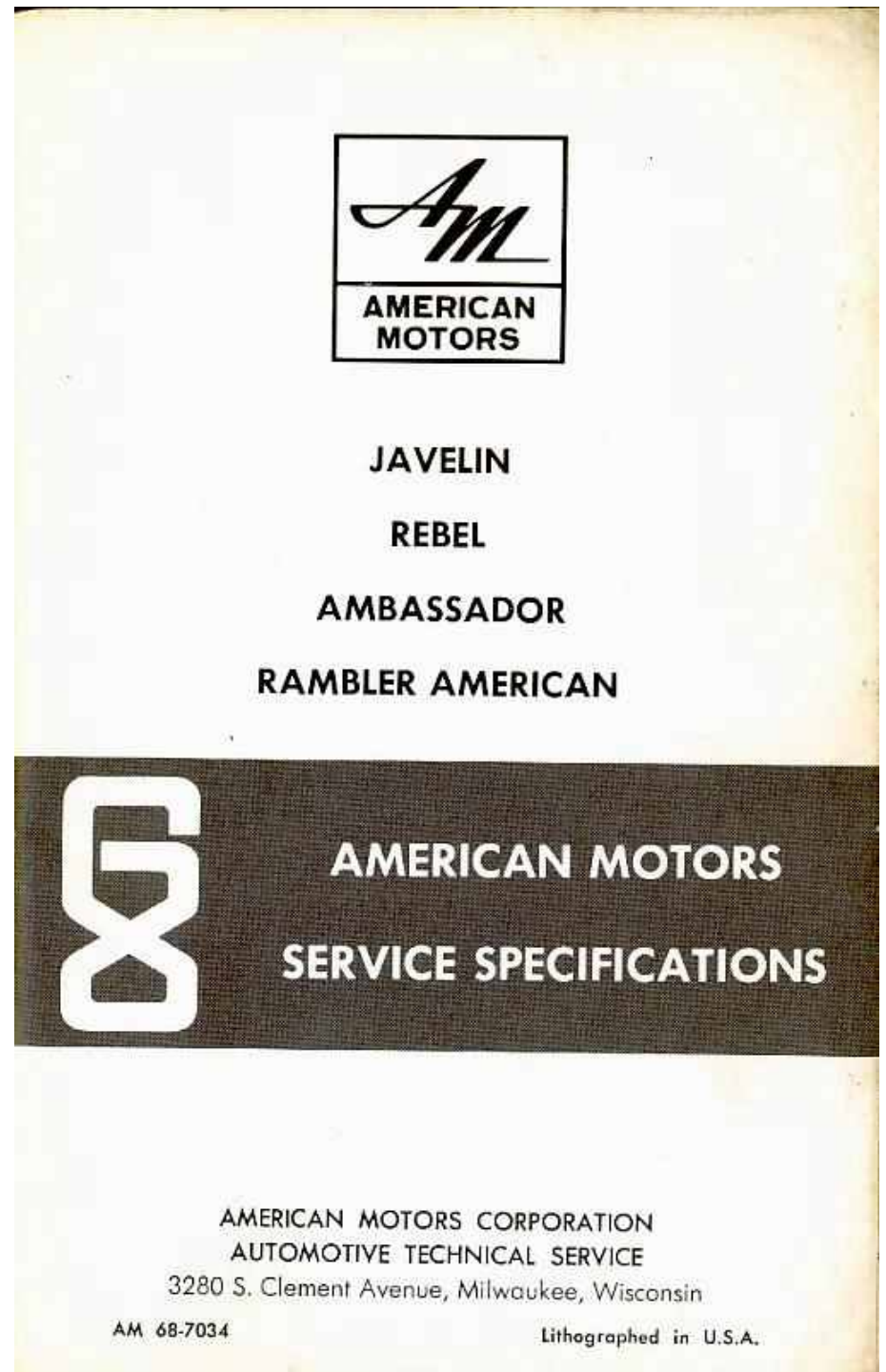


Courtesy of www.AMX-perience.com



FOREWORD

This handbook contains tune-up, service specifications and other technical data for the 1968 Javelin, Rebel, Ambassador and Rambler American 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 data and specifications contained in this handbook were in effect at the time of publication. American Motors reserves the right to discontinue models, or change specifications or design, without notice and without incurring obligation.

1968 AMERICAN MOTORS SERVICE SPECIFICATIONS

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BODY IDENTIFICATION

A unit body number plate riveted to the left front door below the door lock is visible when the door is open.

UNIT BODY NUMBER PLATE

Milwaukee built bodies (10-80 Series) start with Body Number 1.

Kenosha Lake Front Plant built bodies start with Body Number R-1.

Kenosha Main Body Plant built bodies (01) start with Body Number 1.

Brampton (Canada) Assembly Plant built bodies start with Body Number 800001, which is also used as the Car Built sequence number.

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

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 these plates must be listed when any references are made to the body or when ordering parts and material for the body.

MODEL NUMBERS**RAMBLER AMERICAN (6801 Series)**

Model	Style
6805	4-Door Sedan
6805-5	4-Door Sedan "440"
6806	2-Door Sport Sedan
6808-5	4-Door Station Wagon "440"
6809-7	2-Door Hardtop "Rogue"

REBEL (6810 Series)

Model	Style
6815	4-Door Sedan "550"
6815-5	4-Door Sedan "770"
6817	2-Door Convertible "550"
6817-7	2-Door Convertible "SST"
6818	4-Door Station Wagon "550"
6818-5	4-Door Station Wagon "770"
6819	2-Door Hardtop "550"
6819-5	2-Door Hardtop "770"
6819-7	2-Door Hardtop "SST"

JAVELIN (6870 Series)

Model	Style
6879-5	2-Door Hardtop
6879-7	2-Door Hardtop "SST"

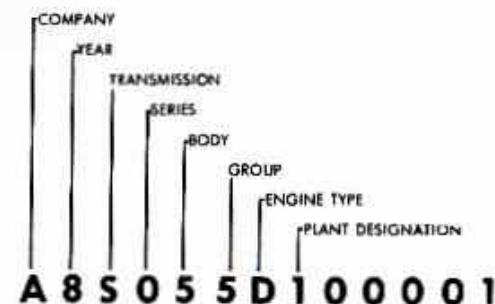
AMBASSADOR (6880 Series)

Model	Style
6885-2	4-Door Sedan
6885-5	4-Door Sedan "DPL"
6885-7	4-Door Sedan "SST"
6888-5	4-Door Station Wagon "DPL"
6889-2	2-Door Hardtop

6889-5	2-Door Hardtop "DPL"
6889-7	2-Door Hardtop "SST"

VEHICLE IDENTIFICATION

A thirteen (13) digit vehicle identification number plate is welded to the top of the right wheelhouse panel under the hood and riveted to the "A" post, visible through the windshield.

**Vehicle Identification Plate**

The vehicle identification number is decoded as follows:

First Digit—"A" for American Motors Corporation.

Second Digit—"8" for 1968

Third Digit—Transmission

- S—Standard Column Shift (3 speed)
- O—Overdrive Column Shift (3 speed)
- A—Automatic Column Shift (3 speed)
- C—Floor Shift Automatic (3 speed)
- F—Four Speed Floor Shift W/Column
- M—Four Speed Floor Shift Floor Mount

Fourth Digit—Series

- O—American
- 1—Rebel
- 7—Javelin
- 8—Ambassador

Fifth Digit—Body

- 5—4-Door Sedan
- 6—2-Door Sedan
- 7—2-Door Convertible
- 8—4-Door Station Wagon
- 9—2-Door Hardtop

Sixth Digit—Group

- 0—Basic, 550
- 2—"Ambassador"

IDENTIFICATION

5—"440," "770," "Javelin," "DPL"

7—"Rogue," "SST"

Seventh Digit—Engine

A—199 OHV Six, 1V

B—232 OHV Six, 1V

C—232 OHV Six, 2V

M—290 V-8, 2V

N—290, 4V

S—343, 2V

T—343, 4V

Eighth Through Thirteenth Digit—Sequential Serial Number:

100001 through 700000—Kenosha

700001 through 1000000—Brampton

1968 MODEL AND BODY STYLES

	2-Door Sedan	4-Door Sedan	4-Door Sta. Wagon	2-Door Hardtop	2-Door Convertible
RAMBLER					
AMERICAN					
American	6806	6805	-----	-----	-----
440	-----	6805-5	6808-5	-----	-----
Rogue	-----	-----	-----	6809-7	-----
REBEL					
550	-----	6815	6818	6819	6817
770	-----	6815-5	6818-5	6819-5	-----
SST	-----	-----	-----	6819-7	6817-7
JAVELIN					
Javelin	-----	-----	-----	6879-5	-----
SST	-----	-----	-----	6879-7	-----
AMBASSADOR					
Ambassador ..	-----	6885-2	-----	6889-2	-----
DPL	-----	6885-5	6888-5	6889-5	-----
SST	-----	6885-7	-----	6889-7	-----

BODY SPECIFICATIONS

TREAD WIDTH AND WHEEL BASE

Model	Wheel Base	Front Tread	Rear Tread
6801 Six Cyl.	106"	56.00"	55.00"
6801 V-8	106"	56.40"	55.27"
6810 Six Cyl.	114"	58.20"	58.50"
6810 V-8	114"	58.58"	58.50"
6870 Six Cyl.	109"	57.92"	57.00"
6870 V-8	109"	58.36"	57.00"
6880	118"	58.58"	58.50"

OVERALL LENGTH

6801—All	181"
6810—Station Wagon	198"
6810—Two and Four Door Sedans and Convertible	197"
6870—Javelin	189.22"
6880—Station Wagon	203.00"
6880—Two Door Hardtop and Four Door Sedan	202.50"

EXTERIOR DIMENSIONS

	6801	6810	6870	6880
Width (01-Incl. Door Handles)	78.84	77.24	71.89	77.24
Height, Four Door Sedans	54.24	54.61	-----	54.69
Two Door Sedans	54.21	-----	-----	-----
Hardtops	53.36	53.49	51.81 Six	53.57
			52.00 V-8	
Station Wagon	55.24	55.06	-----	55.41
Convertible	-----	54.79	-----	-----
Front Overhang	31.70	31.90	39.70	32.90
Rear Overhang	43.30	51.10	40.52	51.60
Station Wagon	-----	52.10	-----	52.10

INTERIOR DIMENSIONS

American

	2-Door Sedan	4-Door Sedan	4-Door Wagon	2-Door Hardtop
Headroom, Front	39.00	39.00	39.30	38.20
Headroom, Rear	36.60	36.60	37.00	36.50
Legroom, Front	42.00	42.00	42.00	42.00
Legroom, Rear	35.00	35.00	35.50	35.00
Shoulder Room, Front	54.84	54.84	54.84	54.84
Shoulder Room, Rear	54.82	54.82	54.82	54.20
Hiproom, Front	57.40	57.40	57.40	57.40
Hiproom, Rear	57.12	57.12	57.12	56.38

Rebel

	4-Door Sedan	4-Door Wagon	2-Door Hardtop	2-Door Conv.
Headroom, Front	39.80	39.80	38.70	39.35
Headroom, Rear	37.75	38.60	36.50	37.65
Legroom, Front	42.60	42.60	42.60	42.60
Legroom, Rear	38.60	38.60	35.50	35.50
Shoulder Room, Front	60.00	60.00	60.00	60.00
Shoulder Room, Rear	60.00	60.00	59.00	59.00
Hiproom, Front	60.30	60.30	60.30	60.30
Hiproom, Rear	60.40	60.40	59.50	51.24

Javelin

	2-Door Hardtop
Headroom, Front	37.50
Headroom, Rear	36.00
Legroom, Front	43.30
Legroom, Rear	31.50
Shoulder Room, Front	55.00
Shoulder Room, Rear	53.20
Hiproom, Front	57.60
Hiproom, Rear	56.38

Ambassador

	4-Door Sedan	4-Door Wagon	2-Door Hard Top
Headroom, Front	39.80	39.80	38.70
Headroom, Rear	37.75	38.60	36.50
Legroom, Front	42.60	42.60	42.60
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

	American	Rebel Ambassador
Tailgate Opening Width at Floor	50.50	53.66
Tailgate Opening Width at Beltline	47.25	52.24
Tailgate Opening Height	25.75	27.84
Tailgate-to-Ground Height	23.00	22.46
Cargo Length at Floor to Front Seat	75.00	92.63
Cargo Length at Beltline to Front Seat	70.00	82.73
Cargo Width Between Wheelhouse	41.50	45.08
Cargo Length at Floor to Rear Seat	41.25	56.53
Cargo Length at Beltline to Rear Seat	38.25	46.74

TUNE-UP SPECIFICATIONS

ENGINE—Cubic Inch	199-232	290	343
Spark Plugs	N-14Y	N-12Y	N-12Y
Spark Plug Gap .....	.033"-.037"	.033"-.037"	.033"-.037"
Distributor Rotation	CW @ Rotor End	CW @ Rotor End	CW @ Rotor End
Distributor Point Gap .....	.016"	.016"	.016"
Distributor Cam Angle (Dwell)	31°-34°	29°-31°	29°-31°
Breaker Arm Tension	17-21 Oz.	17-21 Oz.	17-21 Oz.
Condenser Capacity .....	.18-.23 Mfd.	.18-.23 Mfd.	.18-.23 Mfd.
Ignition Timing @ 500 RPM	5° BTDC ± 1°	TDC ± 1°	TDC ± 1°
199 Auto.	TDC ± 1°		
199 Manual	5° BTDC ± 1°		
232 (Rogue) Auto.	TDC ± 1°		
232 Auto.	TDC ± 1°		
232 Manual	80-85		
Cylinder Head Torque Foot Pounds	600	90-100	90-100
Engine Idle RPM @ Operating Temperature	Manual Trans. Automatic	650	650
When equipped with Air Conditioning, the Air Condition must be "off" when setting the idle.	525 (In Drive Range)*	550 (In Drive Range)*	550 (In Drive Range)*
Fuel Pump Pressure @ 500 RPM	4-5½ P.S.I.	5-6½ P.S.I.	5-6½ P.S.I.
Cylinder Compression Rating	145 P.S.I.	145 P.S.I.	145 P.S.I.
Valve Adjustment	Hydraulic Lifters	Hydraulic Lifters	Hydraulic Lifters

*Set Parking Brake firmly. Do not accelerate engine.

NOTE: Refer to each particular Technical Service Manual Section for detailed specifications as required.

AUTOMATIC CHOKE SETTINGS

MODEL CARBURETOR	CODE NUMBER	SETTING
1931	3966, 3967, 3968, 4102	1 Rich
RBS	4470S	2 Rich
WCD	4410S, 4537S	Index
6200	8HM2, 8HA2, 8ZA2	Index
AFB	4467S, 4469S	2 Rich
	4468S	1 Rich

ENGINE IDENTIFICATION

Cu. In. Disp.	Symbol
199, O.H.V.	J
232, O.H.V.	L
290, 2 V Carb., V-8	H
290, 4 V Carb., V-8	N
343, 2 V Carb., V-8	S
343, 4 V Carb., V-8	Z

GENERAL

ENGINE MODELS	Cu. In. Disp.
Torque Command Sixes	199
	232
Typhoon V-8	290
	343

TYPE

199-232	In-line, Six, O.H.V.
290-343	90°, V-8, O.H.V.

BORE AND STROKE

199	3.750" × 3.000"
232	3.750" × 3.500"
290	3.750" × 3.280"
343	4.080" × 3.280"

FIRING ORDER

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

COMPRESSION RATIO

199-232	8.5:1
290 Lo-Comp	9.0:1
290 Hi-Comp	10.0:1
343 Lo-Comp	9.0:1
343 Hi-Comp	10.2:1

TAXABLE HORSEPOWER

199-232	33.75
290	45.00
343	53.27

MAXIMUM BRAKE HORSEPOWER*

Bhp @ Eng. R.P.M.	
199	128 @ 4400
232, 1 V Carb	145 @ 4300
232, 2 V Carb	155 @ 4400
290, 2 V Carb	200 @ 4600
290, 4 V Carb	225 @ 4700
343, 2 V Carb	235 @ 4400
343, 4 V Carb	280 @ 4800

*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, 2 V Carb	215 @ 1600
232, 2 V Carb	222 @ 1600
290, 2 V Carb	285 @ 2800
290, 4 V Carb	300 @ 3200
343, 2 V Carb	345 @ 2600
343, 4 V Carb	365 @ 3000

*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.
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RECOMMENDED FUEL

199-232-290	
343 2 V Carb	Regular
290-343 4 V Carb	Premium

ENGINE IDLE R.P.M.

MANUAL TRANSMISSIONS	
199-232	600
290-343	650
AUTOMATIC TRANSMISSION	
199-232	525
290-343	550

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

OIL PRESSURE

All Engines	75 P.S.I. Max.
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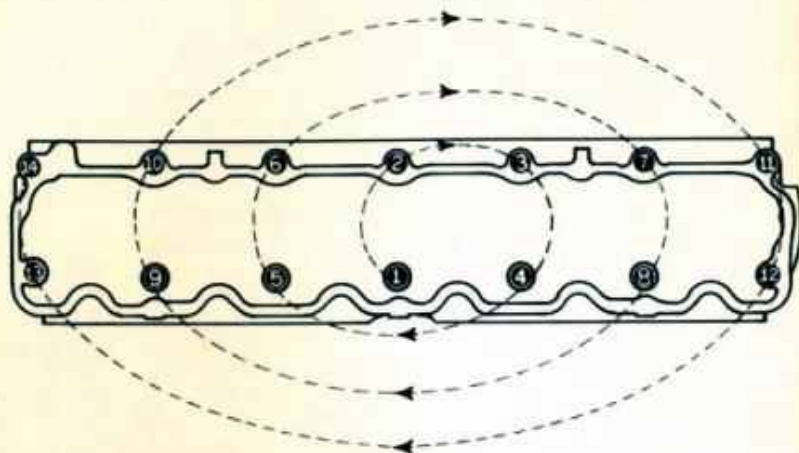
CYLINDER HEAD FLATNESS

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

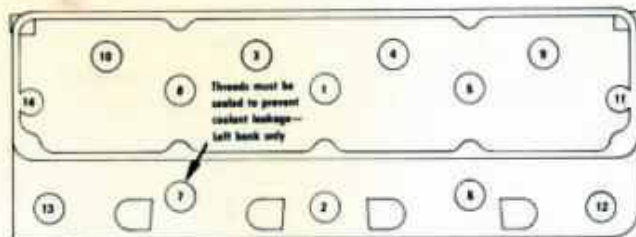
CYLINDER BLOCK FLATNESS

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

CYLINDER HEAD TORQUE TIGHTENING SEQUENCE



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



290-343 V-8—90-100 Foot Pounds Torque

VALVE ARRANGEMENT

Front to Rear
199-232 EI-IE-IE-EI-IE
290-343 (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°

290-343

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°

CAM LOBE LIFT

Intake and Exhaust
199-232254"
290-343265"

ROCKER ARM RATIO

199-232 1.5:1
290-343 1.4:1

VALVE STEM
STANDARD DIAMETER

199-232-290-343
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

199-232-290
Intake 1.787"
Exhaust 1.406"
343
Intake 2.025"
Exhaust 1.625"

VALVE GUIDE TYPE Integral

VALVE GUIDE I.D.—

Intake and Exhaust
All Engines3735"-.3745"

VALVE STEM TO
GUIDE CLEARANCE

Intake and Exhaust
All Engines001"-.003"

VALVE LENGTH

All Engines
Intake and
Exhaust 4.7895"-4.8045"

VALVE FACE ANGLE

199-232
Intake 29°
Exhaust 44°
290-343
Intake 29°
Exhaust 44-1/2°

VALVE SEAT ANGLE

All Engines
Intake 30°
Exhaust 44°

VALVE SEAT RUN-OUT

All Engines Max. .0025"

VALVE SEAT WIDTH

199-232
Intake050"-.075"
Exhaust040"-.060"
290
Intake055"-.065"
Exhaust040"-.060"
343
Intake040"-.060"
Exhaust040"-.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"

290-343
 Closed 85-93 Lbs. 1-13/16"
 Open .. 193-207 Lbs. 1-25/64"
 Free Length Approx. 2-13/16"

VALVE SPRING ASSEMBLED HEIGHT LOWER SEAT TO RETAINER

All Engines 1-13/16"

VALVE TAPPET DIAMETER

All Engines904"-.9045"

VALVE TAPPET TO TAPPET BORE CLEARANCE

All Engines0005"-.002"

HYDRAULIC LIFTER LEAK DOWN RATE

(Kerosene 50 Lb. Load—Travel of
 .125")
 All Engines .. Sec. 10-45 Seconds

ROCKER ARM SHAFT O.D.

199-2328575"-.8585"

ROCKER ARM TO SHAFT CLEARANCE

199-232003"-.005"

TIMING CHAIN DEFLECTION

All Engines Max. 1/2"

CAMSHAFT END PLAY

.0" Engine Operating

CAMSHAFT BEARING OIL CLEARANCE

All Engines001"-.003"

CRANKSHAFT MAIN BEARING JOURNAL STANDARD DIAMETER

199-232 2.4981"-.2.5001"

290-343 2.7469"-.2.7489"
 Rear Main 2.7464"-.2.7479"

CRANKSHAFT MAIN BEARING CLEARANCE

All Engines001"-.002"
 290-343
 Rear Main Only002"-.003"

CRANKSHAFT END PLAY

199-232
 Automatic
 Transmission0015"-.007"
 Conventional
 Clutch0015"-.007"
 Self-Adjusting
 Clutch0015"-.0045"
 290-343
 All008"

CONNECTING ROD JOURNAL DIAMETER

All Engines 2.0934"-.2.0955"

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 Engines001"-.002"

PISTON TO BORE CLEARANCE

199-2320005"-.0013"
 290001"-.0018"
 3430012"-.002"

PISTON PIN TO CONNECTING ROD

Press Fit 2,000 Lbs.

PISTON PIN TO PISTON CLEARANCE

(All Pieces Room Temp.)
 All Engines0003"-.0005"

PISTON RING WIDTH

All Engines 5/64"

PISTON RING SIDE CLEARANCE

199-232 1 and 2 .0015"-.0035"
 3 .000"-.005"
 290-343 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"
 290 3.7502"-.3.7534"
 343 4.0799"-.4.0831"

CYLINDER BORE— OUT OF ROUND

All Engines Max. .005"

CYLINDER BORE TAPER

All Engines Max. .003"

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
 Clearance0005"-.0025"
 Gear End
 Clearance000"-.004"
 (Gears Above Body)
 290-343
 Gear to Body
 Clearance002"-.004"

Gear End
 Clearance0025"-.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
 Block Screws 25-30
 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) 28-33

Clutch Housing to Block

Screws (Bottom) 40-45
All torque values are given in
Foot Pounds unless otherwise
specified.

290-343

Camshaft Gear Screw ... 25-35
Carburetor Hold Down
Nuts 12-15
Connecting Rod Bolt
Nuts 26-30
Crankshaft Main Bearing
Cap Screws 95-105
Cylinder Head Cover
Screws 20-30 In. Lbs.
Cylinder Head Cap
Screws 90-100
Distributor Bracket
Retaining Screws 10-15
Engine Rear Support
Cushion to Case Cap
Screws 30-35
Exhaust Manifold Bolts ... 30-35

Flywheel or Flex Plate to

Crankshaft Screw ... 100-110
Front Support Cushion to
Block Screw 25-30
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.
290 14 Qts.
343 13 Qts.

RADIATOR CAP
PRESSURE

14 P.S.I.

FAN BELT TENSION

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

THERMOSTAT

All Engines except 232 "Rogue"
Starts to Open 195°F. ± 2
Fully Open 218°F.
232 "Rogue"
Starts to Open 205°F. ± 2
Fully Open 228°F.

TORQUE LIMITS—
FOOT POUNDS

Fan Blade to Hub
Screw 15-20
Timing Chain Cover
To Engine—199-232 4-6
290-343 20-30
Thermostat Housing
Screw 10-15
Water Pump Mounting
Screw—290-343 .. 45-50 In. Lbs.
199-232 10-15

BATTERY

Make	Model	Rating	Total No. of Plates
WO/AC Except 343 C.I.D.			
Rambler "Powr-Guard"	2SM50	50 Amperes Hours	54
W/AC or 343 C.I.D.			
Rambler "Powr-Guard"	2SM60	60 Amperes Hours	66
Optional			
Rambler "Powr-Guard"	2SH70	70 Amperes Hours	66

BATTERY TESTS

Specific Gravity Variation
If specific gravity is above 1.235—more than 50 points variation between
cells—unservicable 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 Cable2 Volt

Negative Cable2 Volt

Solenoid Motor Terminal

Input Post of Starting Motor1 Volt

ALTERNATOR

Engine Type	199-232 W/AC	290-343 W/AC
Make	Motorola	Motorola
Model	A12NAM552	A12NAM553
Rotation	CW @ drive end	CW @ drive end
Rated Current Output	35 Amperes @ 15 Volts	40 Amperes @ 15 Volts
Field Current	2.0-2.6 Amperes	1.8-2.4 Amperes
Engine Type	199-232 WO/AC	290-343 WO/AC
Make	Prestolite	Prestolite
Model	ALK 6310	ALK 6311
Rotation	CW @ drive end	CW @ drive end
Rated Current Output	35 Amperes @ 14.2 Volts	35 Amperes @ 14.2 Volts
Field Current	2.4-2.5 Amperes @ 10.0 Volts	2.4-2.5 Amperes @ 10.0 Volts

VOLTAGE REGULATOR

All Motorola Equipped Models	Minimum to Maximum Voltage control at various Ambient Temperatures—10 Ampere Load.
Make	Motorola
Model	R2AM1 (No Adjustment)
All Prestolite Equipped Models	
Make	Prestolite
Model	VSC 6234L (No Adjustment)

0°	14.6-15.4	80°	14.0-14.8
20°	14.6-15.3	100°	13.8-14.6
40°	14.3-15.0	120°	13.7-14.5
60°	14.1-14.9	140°	13.6-14.4
		160°	13.3-14.1

DRIVE BELT TENSION

Use Fan Belt Strand Tension

Gauge J-7316

New Belt	125-145 Lbs.
Belt with Previous Service	90-110 Lbs.
Pre-delivery	90-110 Lbs.

ROTOR FIELD CURRENT DRAW

With Fully Charged Battery, 12.6 ± .2 Volts

35 Ampere Alternator	2.3-2.9 Amperes
40 Ampere Alternator	2.1-2.7 Amperes

STARTER MOTORS

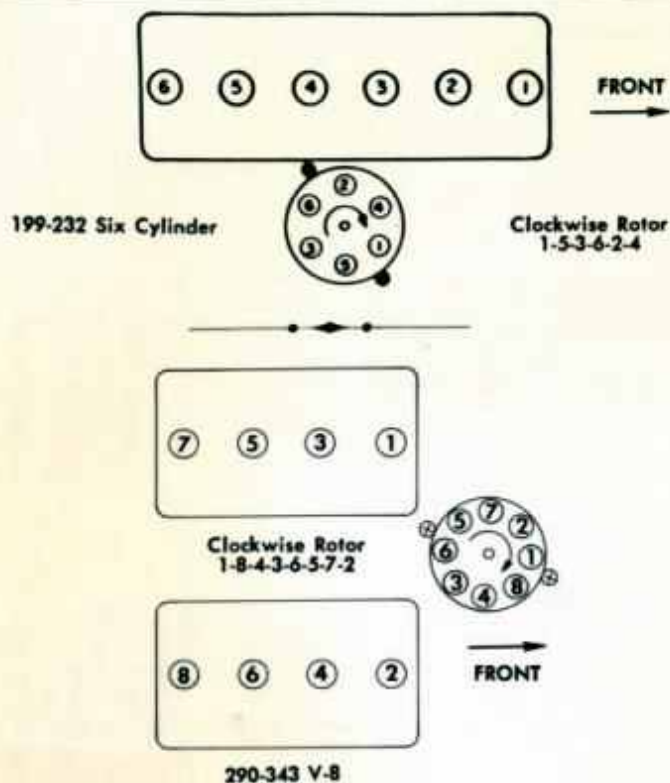
Engine Type	199-232	199-232	199-232	290-343
Make	Delco-Remy	Delco-Remy	Prestolite	—
Model	1107349	1108325	MDY6113	—
Brush Spring Tension	35 Oz. Min.	35 Oz. Min.	35 Oz. Min.	40 Oz.
Free Speed				
Volts	10.6	10.6	10.0	12.0
Amperes	49-76	49-87	80	70
RPM	6200-9400	6200-10,700	4000 Min.	9500 Max.
Lock Test Maximum				
Amperes	270-310	290-425	405	500
Volts	4.3	4.2	4.0	4.5
Brush Length				0.5"
Wear Limit				0.25"

SOLENOID SWITCH

199-232

Make	Delco-Remy
Model	1114336
Hold in Winding	14.5-16.5 Amps. at 10 Volts
Both Winding	41-47 Amps. at 10 Volts

Make	Prestolite
Model	SAJ-4005
Hold in Winding	10.0-11.5 Amps. at 6 Volts
Both Winding	29.9-34.5 Amps. at 6 Volts



DISTRIBUTOR WIRING SEQUENCE AND FIRING ORDER

DISTRIBUTOR—SIX CYLINDER

Engine Type	199-232
Make	Delco-Remy
Model	1110444
Rotation	CW @ Rotor End
Point Opening	.016"
Cam Angle (Dwell)	31°-34°
Breaker Lever Tension	17-21 Oz.
Condenser Capacity	.18-.23 MFD.

NOTE: Dwell Variation Not to exceed 3° between Idle and 1750 RPM.

CENTRIFUGAL ADVANCE

Distributor Degrees and RPM	
Start	2°-3° @ 450

Intermediate	8°-10° @ 1000
Maximum	12°-14° @ 2200

VACUUM CONTROL

199-232	
Make	Delco-Remy
Model	1116207
Inches of Mercury to Start Advance	5"-7"
Inches of Mercury for Full Advance	16"-17"
Maximum Advance (Dist. Degrees)	11°

DISTRIBUTOR—V-8

Engine Type	290-343 2V	290 4V	343 4V
Make	Delco-Remy	Delco-Remy	Delco-Remy
Model	1111106-290 1111472-343	1111198	1111191
Rotation	CW @ Rotor End	CW @ Rotor End	CW @ Rotor End
Point Opening	.016"	.016"	.016"
Cam Angle (Dwell)	29°-31°	29°-31°	29°-31°
Breaker Lever Tension	17-21 Oz.	17-21 Oz.	17-21 Oz.
Condenser Capacity	.18-.23 MFD.	.18-.23 MFD.	.18-.23 MFD.

NOTE: Dwell Variation Not to exceed 3° between Idle and 1750 RPM.

CENTRIFUGAL ADVANCE

	1111106	1111198	1111191 & 1111472
Distributor Degrees and RPM			
Start	0°-1° @ 400	0°-1° @ 375	0°-1° @ 450
Intermediate	0°-2° @ 475	7.5°-9.5° @ 800	7.5°-9.5° @ 1000
Intermediate	7.5°-9.5° @ 925		
Maximum	15°-17° @ 2200	14°-16° @ 1950	13°-15° @ 2200

VACUUM CONTROL

Engine Type	290-2 & 4V, 343-2V	343-4V
Make	Delco-Remy	Delco-Remy
Model	1115362	1115363
Inches of Mercury to Start Advance	4"-6"	8"-10"
Inches of Mercury to Full Advance	18"-19.5"	18.5"-20.5"
Maximum Advance (Distributor Degrees)	12°	12°

IGNITION COIL

Engine Type	199-232	199-232	290-343	290-343
Make	Delco-Remy	Prestolite	Delco-Remy	Prestolite
Model	1115294	CAS-201691	1115266	CAH-201632
Primary Resistance OHM	1.77-2.05	1.77-2.05	1.77-2.05	1.65-1.79
Secondary Resistance OHM	3,000-20,000	3,000-20,000	6,500-9,500	9,400-11,700

IGNITION RESISTANCE WIRE

Resistance @ 70°F.	1.35 ± 0.5 OHM (290-343)
	1.80 ± 0.5 OHM (199-232)

PRIMARY CIRCUIT VOLTAGE DROPS

Positive battery cable to ignition primary terminal of ignition coil (yellow wire at voltage regulator).

Not to exceed .4 Volt

Distributor terminal of ignition coil
and ground

Not to exceed .2 Volt

Ignition Cables

Resistance Value Per Foot
Spark Plug Lead—3000-7000 OHMS
Coil Lead—7500-12,500 OHMS

SPARK PLUG

	Six Cylinder	V-8
Make	Champion N-14Y	Champion N-12Y
Spark Plug Gap .....	.033"-.037"	.033"-.037"
Torque	25-30 Foot Pounds	25-30 Foot Pounds
Thread	14MM 3/4"	14MM 3/4"
	Proj. Core	Proj. Core

IGNITION TIMING

Check or set all ignition timing settings at 500 RPM.
After checking or setting ignition timing, set final idle speeds as listed below.
When equipped with Air Conditioning, the final idle RPM must be set
with Air Conditioning "OFF."

ENGINE C.I.D.	TRANSMISSION	TIMING	FINAL IDLE SPEED
199	Automatic	5° BTDC ± 1°	525 In Drive Range*
199	Manual	TDC ± 1°	600
232	Auto. (6809-7 Rogue)	5° BTDC ± 1°	525 In Drive Range*
232	Automatic	TDC ± 1°	525 In Drive Range*
232	Manual	TDC ± 1°	600
290-343	Automatic	TDC ± 1°	550 In Drive Range*
290-343	Manual	TDC ± 1°	650

*CAUTION: Apply Park Brake Firmly,
Do Not Accelerate Engine.

FUSES AND CIRCUIT BREAKERS

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. Also, circuit breakers are used on some individual circuits.

6801—70 Series

Circuit	Fuse or Circuit Breaker	Part Number	Rated Amps	Fuse or C.B. Location	No. of Bulbs & Bulb No.
Headlights	C-1		20	In Switch	2-6012
Hi-Beam Indicator					1-158
Indicators	F-1	G147682 (SAE-4)	4	Fuse Panel	1-158
Alternator Light					1-158

Circuit	Fuse or Circuit Breaker	Part Number	Rated Amps	Fuse or C.B. Location	No. of Bulbs & Bulb No.
6801—70 Series (Continued)					
Oil Pressure Light					1-158
Brake System Light					1-158
Parking Brake Light					1-257
Stop, Tail & Rear Turn Signals	F-2	G147684 (SAE-9)	9	Fuse Panel	2-1157
Front Park & Front Turn Signals					2-1157
Instrument Lights					3-158
Heater Control Light (01) (70)					1-1445
License Plate Light					1-1816
Auto. Trans. Light					1-67
Tachometer Light					1-1445
					1-1895
Dome Light	F-3	G147684	9	Fuse Panel	1-1004 (1)
Cargo Light (Wagon) (01 only)					1-1004
Courtesy Lights (01) (70)					2-94
Courtesy Lights (Conv.) (01 only)					2-1004
Glove Box Light (01) (70)					2-89
Trunk Light (01 only)					1-57
					1-53
					1-89
Heater Motor	F-4	G106653	20 (2)	Fuse Panel	
Air Cond. Clutch					
Overdrive Trans. (01 only)					
Automatic Trans.					
Stop Lights	F-5	G147684	9	Fuse Panel	2-1157
4-Way Flashers					4-1157
4-Way Flasher Ind.					2-158
Turn Signals	F-6	G147684	9	Fuse Panel	2-1157
Turn Signal Indicators					2-158
Radio Feed & Dial Light					1-1892
Spotlight Feed					1-4405
Backup Lights					2-1156
Convertible Top (01 only)	C-2	3171130	30	Inst. Panel	
Windshield Wipers	C-3		6	In Switch	
Tailgate, Front Switch (01 only)	C-5		25	Inst. Panel	
Tailgate, Rear Switch (01 only)	C-6		25	Inst. Panel	

(1) 2-211 for Hardtops (01 only)

(2) 30 Amps. for Air Conditioning.

Circuit	Fuse or Circuit Breaker	Part Number	Rated Amps	Fuse or C.B. Location	No. of Bulbs & Bulb No.
6810—80 Series					
Headlight, Regular	C-1		20	In Switch	2-4001
Headlight, Hi-Beam					2-4002
Hi-Beam Indicator					1-158
Indicators	F-1	G147682 (SAE-4)	4	Fuse Panel	1-158
Alternator Light					1-158
Oil Pressure Light					1-158
Brake System Light					1-158
Parking Brake Light					1-257
Stop, Tail & Rear Turn Signals	F-2	G147684 (SAE-9)	9	Fuse Panel	2-1157
Front Park & Front Turn Signals					2-1157 (1)
Instrument Lights					3-158 (2)
Headlight Switch & Windshield Wiper Switch Light					1-1445
Heater Control Light					1-1881
Ignition Switch & Cigarette Lighter Light					1-1445
Clock Light					1-57
License Plate Light					1-67
Auto. Trans. Light					1-1445
Cruise-Command Light					1-1445
A.C. Thermostat Light	F-3	G147684	9	Fuse Panel	1-1445
Radio Light					1-1815
Tachometer Light					1-1895
Ashtray Light					1-1881
Dome Light					1-1004 (3)
Cargo Light (Wagon)					1-1004
Courtesy Lights					2-94
Courtesy Lights (Conv.)					2-89
Clock Feed					1-1816
Glove Box Light					1-57
Trunk Light					1-89
Heater Motor	F-4	G106653	20 (4)	Fuse Panel	
Air Cond. Clutch					
Overdrive Trans.					
Automatic Trans.					
Stop Lights	F-5	G147684	9	Fuse Panel	2-1157
4-Way Flashers					4-1157
4-Way Flasher Ind.					2-158
Turn Signals	F-6	G147684	9	Fuse Panel	2-1157
Turn Signal Indicators					2-158
Vibra-Tone Feed					

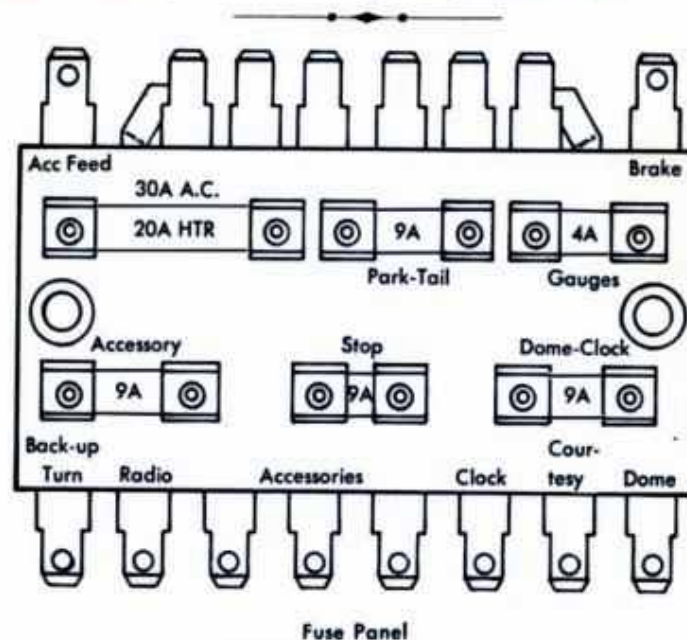
Circuit	Fuse or Circuit Breaker	Part Number	Rated Amps	Fuse or C.B. Location	No. of Bulbs & Bulb No.
6810—80 Series (Continued)					
Cruise-Command Feed					
Spotlight Feed					1-4405
Backup Lights					2-1156
Radio Feed					
Convertible Top	C-2	3181127	30	Inst. Panel	
Windshield Wipers	C-3		6	In Switch	
Electric Windows	C-4	3186892	20	Inst. Panel	
Tailgate, Front Switch	C-5	3186892	20	Inst. Panel	
Tailgate, Rear Switch	C-6	3186892	20	Inst. Panel	

(1) 2-1157A for (Amber bulbs).

(3) 2-1004 for Hardtops.

(2) 2-158 for Rebel.

(4) 30 Amps for Air Cond.



EXHAUST EMISSION CONTROL SYSTEMS

Two systems are used; "Engine-Mod" and "Air Guard"

199-232 C.I.D. engines with manual or automatic transmission use the "Engine-Mod" system.

290-343 C.I.D. engines with automatic transmissions use the "Engine-Mod" system.

290-343 C.I.D. engines with manual transmissions use the "Air-Guard" system.

"Engine-Mod" systems incorporate the following:

199-232

"Low-Quench" combustion chamber.

Emission calibrated distributor and carburetor.

"Closed" positive crankcase ventilation system.

290-343—Automatic Transmission

Emission calibrated distributor and carburetor.

"Thermostatically-Controlled" carburetor air-cleaner.

"Closed" positive crankcase ventilation system.

"Air-Guard" system incorporates the following:

290-343—Manual Transmissions

"Air-Guard" air pump system.

Emission calibrated distributor and carburetor.

"Thermostatically-Controlled" carburetor air-cleaner (4V only).

"Closed" positive crankcase ventilation system.

IDLE SPEED AND MIXTURE ADJUSTMENTS

The following adjustment procedures must be performed exactly as outlined to obtain "lean-as-possible" idle speed and mixture settings.

CAUTION: Set park brake firmly. Do not accelerate.

"ENGINE-MOD" EQUIPPED VEHICLES (ALL 6-CYLINDER AND V-8 ENGINES EQUIPPED WITH AUTOMATIC TRANSMISSION)

Six-Cylinder Engines—1 and 2 Venturi Carburetors

Before starting engine turn mixture screw(s) clockwise until seated (lightly). Then turn counterclockwise one turn off seat(s) as a starting point.

Start engine and set idle speed at 50 RPM less than specified setting:

6 cylinder with man. transmission—600 RPM

6 cylinder with auto. transmission—525 RPM IN "DRIVE" RANGE.

Adjust idle mixture as follows:

Turn mixture screw (or screws) counterclockwise until a loss of engine speed is indicated. In the case of the 2 venturi, move both screws equally unless engine definitely demands otherwise.

Turn mixture screw(s) clockwise (leaner) until speed is regained. Continue clockwise until speed begins to drop.

Turn mixture screw(s) back out (counterclockwise—richer) until maximum speed is just regained at a "lean-as-possible" mixture adjustment.

Readjust idle speed to the specified RPM.

V-8 Engines (Automatic Transmission) 2 & 4 Venturi

Before starting engine—Idle mixture screws are limited in travel by fixed

stops to approximately 7/8 turns rotation. Starting at counterclockwise stop (full rich), turn mixture screws 1/2 turn clockwise (leaner).

Start engine. Adjust idle speed to 50 RPM less than specified setting:

V-8 with automatic transmission (2 and 4 venturi carburetor)—550 RPM IN DRIVE

Adjust idle mixture as follows:

Turn mixture screws counterclockwise (richer) until a loss of engine speed is indicated or screw is at stop. Move screws evenly unless engine definitely demands otherwise.

Turn both screws clockwise (leaner) until speed is regained. Continue clockwise until speed begins to drop.

Turn mixture screws back out (counterclockwise—richer) until maximum speed is just regained at a "lean-as-possible" mixture adjustment. It is possible that this point is the maximum rich stop position.

Readjust idle speed to specified RPM.

AIR-GUARD EQUIPPED VEHICLES (V-8 ENGINES EQUIPPED WITH MANUAL TRANSMISSIONS)

Four Venturi Carburetor

Before starting engine turn mixture screws clockwise until seated (lightly). Turn screws counterclockwise one turn off seat as a starting point.

Start engine. Adjust idle speed screw to idle engine at specified speed (650 RPM).

Adjust idle mixture as follows:

Turn mixture screws counterclockwise (richer) until a loss of engine speed is indicated. Move both screws equally unless engine definitely demands otherwise.

Turn both screws clockwise (leaner) until speed is regained. Continue clockwise until speed begins to drop.

Turn mixture screws back out (counterclockwise—richer) until maximum speed is just regained at a "lean-as-possible" mixture adjustment. Readjust idle speed to specified RPM. If any change occurred over 30 RPM, repeat idle mixture adjustment.

Two Venturi Carburetor

Before starting engine—Idle mixture screws are limited in travel by fixed stops to approximately 7/8 turns rotation. Starting at counterclockwise stop (full rich), turn mixture screws 1/2 turn clockwise (leaner).

Start engine. Adjust idle speed screw to idle engine at specified speed (650 RPM).

Adjust idle mixture as follows:

Turn mixture screws counterclockwise (richer) until a loss of engine speed is indicated or screw is at stop. Move screws equally unless engine definitely demands otherwise.

Turn both screws clockwise (leaner) until speed is regained. Continue clockwise until speed begins to drop.

Turn mixture screws back out (counterclockwise—richer) until maximum speed is just regained at a "lean-as-possible" mixture adjustment. It is possible that this point is the maximum rich stop position.

Readjust idle speed to specified RPM. If any change occurred over 30 RPM, repeat idle mixture adjustment.

FUEL PUMP SPECIFICATIONS

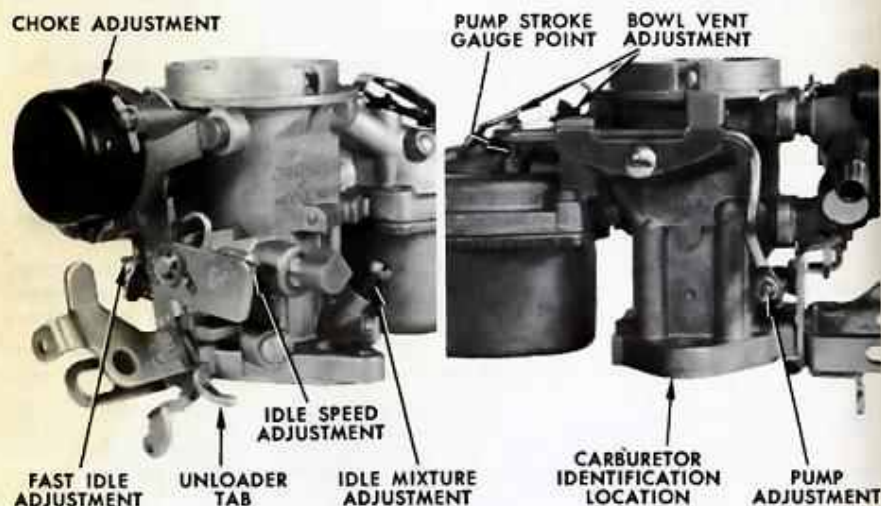
Fuel Pump Pressure 4 to 5-1/2 P.S.I. on Six cylinder engines and 5 to 6-1/2 P.S.I. on V-8 engines.

Fuel Pump Volume—One Quart in One Minute @ 500 RPM.

Vacuum Test—14" to 19" hg. @ 800 to 1000 RPM.

FUEL TANK CAPACITIES (U.S. GALS.)

American Series	16
Rebel and Ambassador Series (Except Three-Seat Station Wagon)	21-1/2
Rebel and Ambassador Series (Three-Seat Station Wagon) and Javelin	19

CARBURETOR SETTINGS AND ADJUSTMENTS**MODEL RBS—ONE VENTURI CARBURETOR**

232 C.I.D.—AUTO. TRANSMISSION—CODE NUMBER 4470S

Float Adjustment—To check the float setting the carburetor must be removed from the engine. Remove the carburetor bowl. With the carburetor inverted the vertical distance from the casting to the small bump at the outer ends of the float should be 9/16" (.5625"). Adjust by bending float arm.

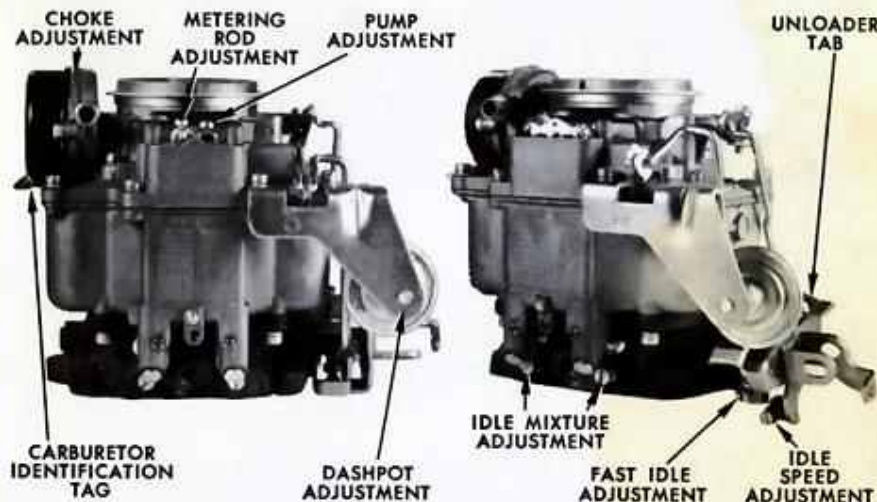
Pump Adjustment—With throttle valve closed, .000"-.015" (.015" gauge) clearance between shoulder on pump plunger shaft and pump arm. Turn pump adjusting nut on throttle lever.

Bowl Vent Adjustment—5/64" (.080" gauge) clearance between vent valve and casting with throttle fully closed and pump adjusted. Adjust by bending connector rod at pump end.

Fast Idle Adjustment—2000 RPM on high step of fast idle cam, engine at normal operating temperature. Bend tab on throttle lever.

Unloader Adjustment—1/8" (.125" gauge) clearance between choke valve and air horn, with wide open throttle. Bend tab on throttle lever.

Choke Adjustment—Two notches rich.

MODEL WCD—TWO VENTURI CARBURETOR

232 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 4410S
AUTO. TRANSMISSION—CODE NUMBER 4537S

Float Adjustment—With bowl cover removed and inverted, the vertical clearance between each float and bowl cover should be 7/32" (.215" gauge). Adjust by bending float arms.

Pump Adjustment—With throttle closed, top surface of pump arm parallel with top surface of dust cover shroud. Adjust by bending connector rod to throttle lever.

Metering Rod Adjustment—With throttle closed, hold metering rods in maximum down position. Tighten clamp screw securely with metering rod arm contacting vacuumeter link.

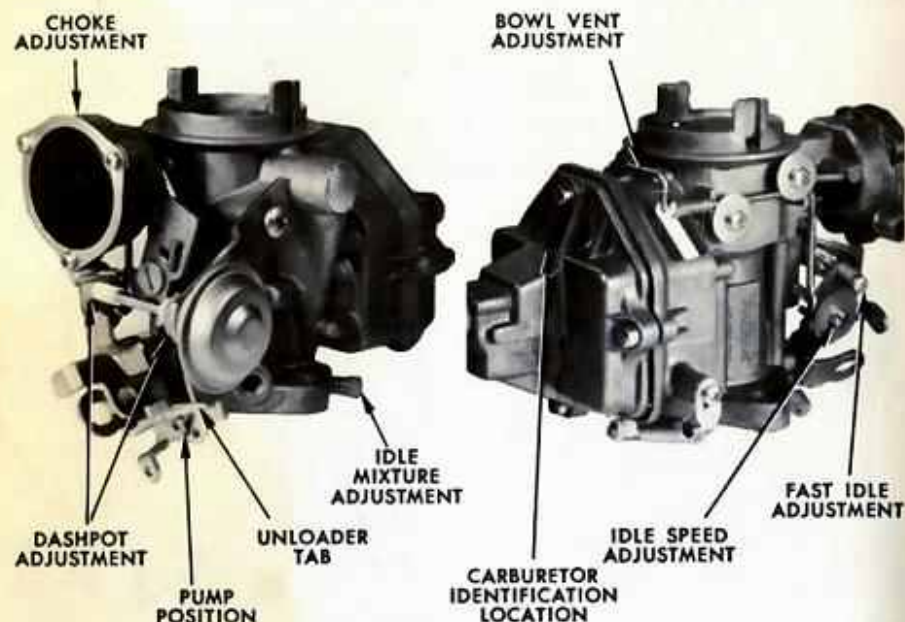
Fast Idle Adjustment—2000 RPM on high step of cam with engine at normal operating temperature. Turn adjusting screw.

Choke Unloader Adjustment—With throttle wide open, 3/16" (.190" gauge) clearance between choke valve and air horn. Bend tab on throttle lever.

Choke Adjustment—Index.

Dashpot Adjustment—5/64" (.080" gauge) clearance between stem and throttle lever—Turn dashpot to adjust.

MODEL 1931—ONE VENTURI CARBURETOR



199 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 3966
 AUTO. TRANSMISSION—CODE NUMBER 3967
 232 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 3968
 AUTO. TRANSMISSION—CODE NUMBER 4102

Float Adjustment—With fuel bowl removed and inverted, vertical clearance between ends of float and bowl should be $5/16"$ (.300" gauge). Bend float arm.

Choke Unloader Adjustment—Clearance between choke valve and air horn $15/64"$ (.230" gauge) with throttle wide open. Bend tab on throttle lever.

Initial Choke Valve Clearance Adjustment

3966, 3967, 3968— $1/8"$ (.125" gauge). 4102— $9/64"$ (.140" gauge).

Hold choke piston against stop screw, measure clearance between choke valve and air horn. To adjust, turn choke piston stop screw.

Automatic Choke Adjustment—One notch rich.

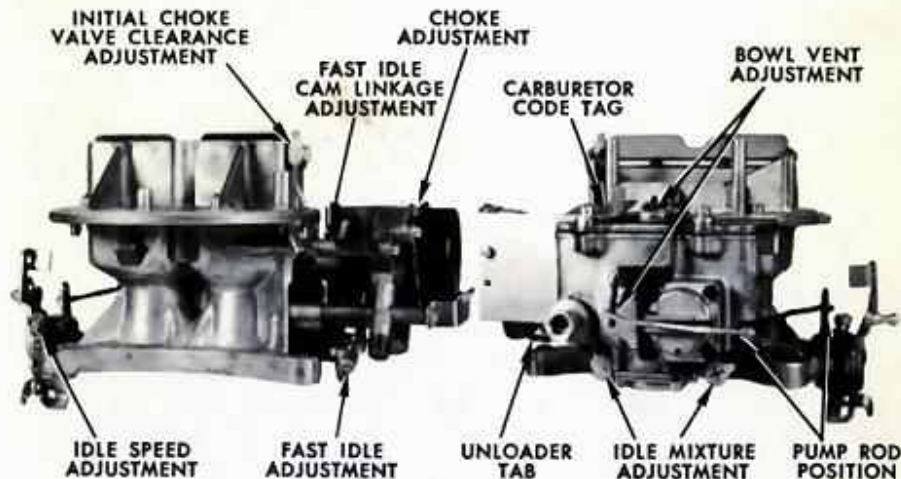
Accelerator Pump Position—3967—No. 3 hole. 3966, 3968, 4102—No. 2 hole.

Bowl Vent Adjustment— $1/16"$ (.065" gauge) clearance between valve and seat at curb idle. Bend vent rod.

Fast Idle Adjustment—1600 RPM on second step of fast idle cam with engine at normal operating temperature. Turn adjusting screw.

Dashpot Adjustment— $3/32"$ (.095" gauge) clearance between stem and throttle lever—Turn dashpot to adjust.

MODEL 6200—TWO VENTURI CARBURETOR



290 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 8HM2
 AUTO. TRANSMISSION—CODE NUMBER 8HA2
 343 C.I.D.—AUTO. TRANSMISSION—CODE NUMBER 8ZA2

Float Adjustment (Dry)—With air horn removed, raise float until fuel inlet needle is lightly seated. Distance from bowl gasket surface to top of float at a point $1/8"$ from free end—should be $3/8"$. Bend tab on float lever.

Float Adjustment (Wet)—With air horn removed and fuel level stabilized in bowl, distance from top of bowl to surface of fuel should be $3/4"$. Measurement must be made at least $1/4"$ away from any bowl vertical surface. Bend tab on float lever. Stop engine when adjusting.

Initial Choke Valve Clearance Adjustment

8HA2, 8ZA2— $9/64"$ (.140" gauge). 8HM2— $1/8"$ (.125" gauge).

With a .035" gauge in choke piston slot, measure clearance between front of choke valve and air horn wall. Turn the choke valve clevis nut to obtain proper clearance.

Fast Idle Cam Linkage Adjustment—Rotate thermostatic spring housing 90° rich from index. With fast idle screw on cam index mark, clearance between front of choke valve and air horn wall should be $7/64"$ (.120" gauge).

Choke Unloader Adjustment—Clearance between choke valve and air horn wall $1/16"$ (.065" gauge) with throttle wide open. Adjust by bending tab on throttle lever.

Automatic Choke Adjustment—Index.

Accelerator Rod Position—No. 3 Hole. Holes are numbered from throttle shaft out. Opposite end, inboard hole of pump lever.

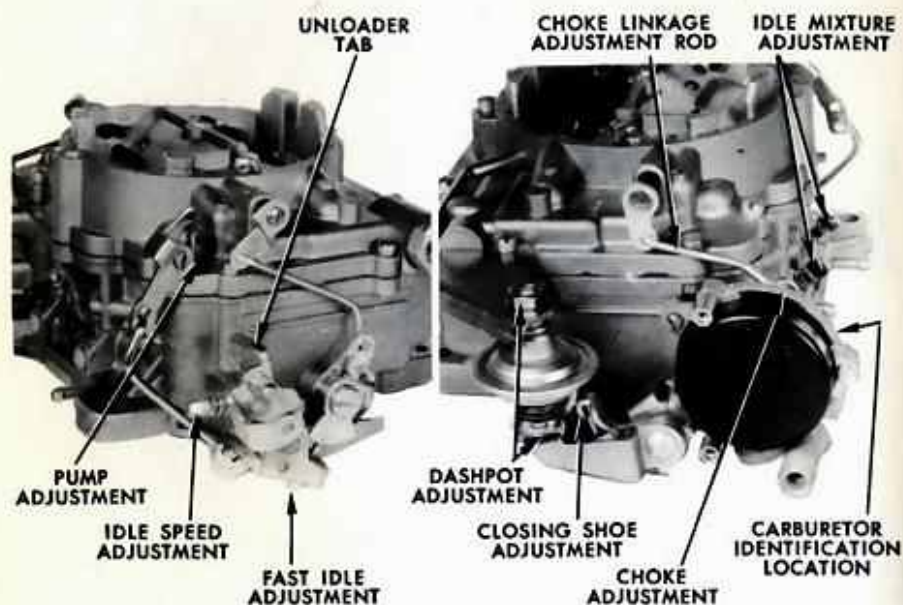
Bowl Vent Adjustment— $1/16"$ (.065" gauge) clearance between valve and casting at curb idle. Adjust by bending vent rod at pump lever.

Fast Idle Adjustment—1600 RPM with fast idle screw aligned on arrow mark

of cam, engine at normal operating temperature. Adjust fast idle screw.

Dashpot Adjustment— $9/64''$ (.140" gauge) clearance between stem and throttle lever. Turn dashpot to adjust.

MODEL AFB—FOUR VENTURI CARBURETOR



290 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 4467S
 343 C.I.D.—MAN. TRANSMISSION—CODE NUMBER 4469S
 343 C.I.D.—AUTO. TRANSMISSION—CODE NUMBER 4468S

Float Adjustment—With air horn removed and inverted, clearance between outer end of each float and air horn should be $5/16''$ (.300" gauge). Bend float lever. Float drop 2".

Initial Choke Valve Clearance Adjustment

4467S— $5/64''$ (.085" gauge). 4469S— $7/64''$ (.110" gauge). 4468S— $3/32''$ (.095" gauge).

With a .026" gauge in choke piston cylinder, measure clearance between choke valve and air horn. Bend choke rod.

Automatic Choke Adjustment—4469S, 4467S—2 notches rich. 4468S—1 notch rich.

Accelerator Pump Adjustment—4469S, 4468S— $17/64''$ (.260" gauge). 4467S— $15/64''$ (.245" gauge). Measure clearance from under "S" link to bowl cover at closed throttle with rod in center hole. Bend pump rod.

Fast Idle Adjustment—2000 RPM with fast idle screw aligned with cam index and engine at normal operating temperature. Turn adjusting screw.

Choke Unloader Adjustment— $5/32''$ (.160" gauge) clearance between choke valve and air horn with throttle wide open. Bend tab on throttle lever.

Secondary Throttle Lever Adjustment—Secondary valves to start opening when primary valves are open $7/16''$ (.437"). Bend throttle operating rod.

Closing Shoe Adjustment—.020" clearance between shoes at closed throttle. Bend secondary shoe.

Dashpot Adjustment— $11/64''$ (.170" gauge) clearance between stem and throttle lever. Turn dashpot to adjust.

TORQUE LIMITS—FOOT POUNDS

Carburetor Hold-Down Nuts	12-15
Exhaust Manifold Bolts—V-8	30-35
Exhaust Pipe to Manifold Nuts	20-25
Intake and Exhaust Manifold Bolts and Nuts—Six Cyl.	20-25
Fuel Pump Screw	15-17
Intake Manifold Bolts—V-8	40-45
Air Pump Mounting Bolts	18-22

DRIVEN MEMBER	DIAMETER	CLUTCH HOUSING ALIGNMENT
199-232	9-1/8"	Maximum Indicator Reading of Clutch Housing Bore Concentricity to Center Line
290	10"	Maximum Indicator Reading of Clutch Housing Transmission Mounting Face to Crankshaft Center Line ..
343	10-1/2"	

CLUTCH PEDAL FREE TRAVEL

7/8" to 1-1/8"—1" Desired

CLUTCH PEDAL HEIGHT

290-343
6-1/2" Bare Floor Pan to Bottom of Pedal

CLUTCH RELEASE LEVER HEIGHT

Adjust with Tool J-1048
199-232—3/32" below hub of gauge
199 H.D.—290—1/32" above hub—
Three Speed Trans.
290—flush with hub of gauge—Four
Speed Trans. and H.D. 290 (3-Sp.)
343—3/32" above hub—Four Speed
Trans.

TORQUE LIMITS—FOOT POUNDS

Clutch Cover Screw J & L	30
H-Z	40
Clutch Housing to Motor Dowel Bolt Nut	45
Clutch Housing to Motor Screw 290-343	45
Clutch Housing to Engine Block Screw 199-232 (Top)	35
(Bottom)	45
290-343	30
Clutch Housing Spacer to Block Screw 290-343	15
Clutch Throwout Lever Pivot	35
Transmission Case to Clutch Housing Screw	55

TRANSMISSION**MANUAL AND OVERDRIVE****3-SPEED TRANSMISSION END PLAY SPECIFICATIONS**

	199 C.I.D.	232 C.I.D.	290-343 C.I.D.
First Speed Gear .....		.003" to .012"	.003" to .014"
Second Speed Gear .....	.003" to .010"	.003" to .018"	.003" to .018"
Countershaft Gear .....	.003" to .006"	.005" to .019"	.005" to .018"

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.

**4-SPEED TRANSMISSION
END PLAY SPECIFICATIONS**

290 AND 343 C.I.D.	
First Speed Gear .....	.003" to .021"
Second Speed Gear ....	.003" to .014"
Third Speed Gear .....	.003" to .018"
Countershaft Gear .....	.004" to .017"

First, Second and Third 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.

Gear Ratios

199 3-Speed	
1st	2.605 to 1
2nd	1.630 to 1
High	1 to 1
Reverse	3.536 to 1

232 3-Speed		High	1 to 1
1st	2.636 to 1	Reverse	2.548 to 1
2nd	1.605 to 1	O.D.	.700 to 1
High	1 to 1	290-343 4-Speed	
Reverse	2.636 to 1	1st	2.64 to 1
O.D.	.700 to 1	2nd	2.10 to 1
290-343 3-Speed		3rd	1.46 to 1
1st	2.548 to 1	4th	1.00 to 1
2nd	1.558 to 1	Reverse	2.71 to 1

SHIFT-COMMAND AUTOMATIC TRANSMISSION**DIAGNOSIS GUIDE**

Step I: The first step in diagnosing a transmission problem is to listen to the customer and have the customer demonstrate the condition of the complaint whenever possible.

When it has been determined that a transmission complaint exists, the following steps should be followed:

Step II: Road test car with kickdown wire disconnected—(refer to "Electrical Kickdown" section).

Step III: Check general engine condition—(tune-up if necessary).

Step IV: Perform a complete transmission tune-up (refer to the "Tune-Up" Section).

Step V: If transmission does not respond to a tune-up, remove and replace valve body.

Step VI: If the problem still exists, the transmission must be removed from the vehicle and overhauled. At this time, the original valve body must be cleaned and reused. Return the new valve body to parts stock.

Follow this chart when looking for the malfunction during the transmission overhaul.

DIAGNOSIS GUIDE

ENGAGEMENTS	Code	UPSHIFT QUALITY	Code
Harsh	c f	1-2 Delayed Followed Close	
Delayed Forward	a z	By 2-3 Shift	a b g
Delayed Reverse	a	2-3 Slips	a e g t
None	a k l m o	1-2 Harsh	b
No Forward D-1	a b i z	2-3 Harsh	f
No Forward D-2	a b z	1-2 Ties Up	f j
No Reverse	a e h		
No Neutral	c		
		DOWNSHIFTS	
UPSHIFTS		No 2-1 in D-1	i y
No 1-2	a y	No 2-1 in L-Range	h y
No 2-3	a e t y	No 3-2	g y
Shift Points Too High	a	Shift Points Too High	a
Shift Points Too Low	a	Shift Points Too Low	a

Diagnosis Guide (Continued)

FORCED DOWNSHIFTS	Code	OTHERS	Code
2-1 Slips	b l z	Poor Acceleration	y o
3-2 Slips	a e g t	Noisy in Neutral	f p d o
3-1 Shifts Above-mph.	a g	Noisy in Park	p d o
2-1 Harsh	a b j	Noisy in All Gears	p r o
3-2 Harsh	e f	Noisy in 1st & 2nd Gear Only	p r w
REVERSE		Park Brake Does Not Hold	q
Slips Or Chatters	a c e h t	Oil Out Breather	a x
Tie Up	a c	Oil Out Fill Tube	a x
LINE PRESSURE		Ties Up in Low, 1st Gear	f a
Low Idle Pressure	a m	Ties Up in D-1, 1st Gear	f a
Low Stall Pressure	a m y	Ties Up in D-1 or D-2, 2nd Gear	f a j
STALL SPEED		Ties Up in D-1 or D-2, 3rd Gear	f a j
Too Low (200 RPM Or More)	o	Chatters—D-1, D-2 or Low	a b z
Too High D-1	u v a b i k o z		
Reverse Too High	u v h e k o		

Correction Code Key

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Sealing rings missing 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 | <ul style="list-style-type: none"> l. Front pump drive tangs or converter hub broken m. Front pump worn o. Converter p. Front 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 y. Output shaft plug missing (6 cyl.) z. Front clutch piston check valve leaks |
|--|---|

SHIFT-COMMAND "TUNE-UP"

Oil Level

Check oil level on the dip stick with the selector lever in Park (P) and the

engine running.

Linkage Adjustment

10-70-80 Series—Adjust linkage at the transmission outer lever for a free

pin fit, with the transmission and the selector lever in the Neutral (N) position.

01 Series—Adjust linkage at the transmission outer lever for a free pin fit with the transmission and the selector lever in the "1" position.

Front Band Adjustment

Insert a .250" gauge between actuating arm and servo body. Tighten adjusting screw to 10 Inch Pounds torque.

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 290 (2V) C.I.D. engines). Back off adjusting screw 1-1/2 turns (290-4V and 343 C.I.D. engines). Tighten lock nut. Raise transmission and tighten cross member to side sill bolts.

.250" GAUGE



10 INCH POUNDS TORQUE



Oil Pressure

Connect oil pressure gauge to transmission.

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 1000 RPM. The pressure gauge should indicate pressure shown on chart.

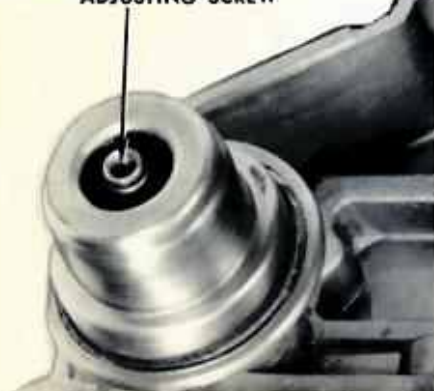
1000 RPM Stall Pressures

Engine Type	Reverse (P.S.I.)	D1, D2, L (P.S.I.)
199 C.I.D.	95	90-100
232 C.I.D. 6801	95	90-100
232 C.I.D. 6810, 70, 80	95	90-100
290 C.I.D. 2V	95	90-100
290 C.I.D. 4V	100	65-75
343 C.I.D.	100	70-80

Curb Idle Pressures		
	Reverse (P.S.I.)	Forward (P.S.I.)
199, 232	55-68	55-68
290 C.I.D. 2V	55-68	55-68
290 C.I.D. 4V	57-67	42-52
343 C.I.D.	57-67	42-52

Adjust vacuum control unit to obtain correct pressure.

VACUUM CONTROL PRESSURE
ADJUSTING SCREW



When pressure is adjusted to specification in "R" (Reverse), move selector lever to each of the forward ranges and check the pressure at 1000 RPM. 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 step IV of 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 Step IV of the Diagnosis Guide.

ELECTRICAL KICKDOWN

No 2-3 Upshift

If no 2-3 shift occurs, disconnect wire from kickdown 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 kickdown switch. If no click occurs the problem may be the valve body solenoid.

TRANSMISSION POWER FLOW AND RATIOS

199-232 and 290 (2V) C.I.D. Engines

Gear	Selector Lever Position	Clutch Applied	Band Applied	Gear Ratio
Neutral	N	None	None	
First	D-1, L, D#, or 1#	Front	Rear*	2.39:1
Second	D-1, D-2, D#, or 2#	Front	Front	1.45:1

TRANSMISSION POWER FLOW AND RATIOS (Continued)

Gear	Selector Lever Position	Clutch Applied	Band Applied	Gear Ratio
Third	D-1, D-2, or D	Front & Rear	None	1.00:1
Reverse	R	Rear	Rear	2.09:1

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

Shift Command Transmission

OVERHAUL CHECKS AND ADJUSTMENTS

199-232 and 290 (2V) C.I.D. Engines

Transmission End Play	.009"-.032"
Available selective thrust washers	.062"-.079"
Rear Clutch Plate Inspection for "Dish"	.010"-.015"
Planetary Pinion End Play	.010"-.020"

TORQUE—FOOT POUNDS

199-232 and 290 (2V) C.I.D. Engines

Converter to Drive Plate Cap Screws	33
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	14
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	28
Valve Body Screws No. 10-24 N.C.	25*
Valve Body to Case 1/4-20 N.C.	75*
Governor Valve Body to Counter Weight	75*
Governor Valve Body Cover to Governor	25*
Case Line Pressure Plug	8

*Inch Pounds

TRANSMISSION POWER FLOW AND RATIOS

290 (4V)—343 C.I.D. Engines

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

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

Shift Command Transmission.

OVERHAUL CHECKS AND ADJUSTMENTS

290 (4V)—343 C.I.D. 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

290 (4V)—343 C.I.D. 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 this trouble-shooting guide. Where possible, a test drive should be taken with the customer to confirm the difficulty and obtain additional information which will be helpful.

Step I: The first step of diagnosing a brake problem is to check the fluid level. If the fluid level is low or appears contaminated bleed the system as described in the "Bleeding Hydraulic Lines" Section and inspect for leaks.

Step II: Adjust the brakes by driving the car in reverse, making 10 to 15 "Hard" brake applications. Repeat the road test. If the problem still exists, follow the appropriate coded steps of the guide.

BRAKE DIAGNOSIS GUIDE

MECHANICAL HYDRAULIC VACUUM (Power Unit)

LOW PEDAL

(Excessive Pedal Travel to Apply Brakes)

FGIM

T

fgj

SPONGY PEDAL

(A Springy Sensation of Pedal Upon Application)

I

TU

HARD PEDAL

(Excessive Pedal Pressure Needed to Stop Vehicle)

AFGK

RTUVW

aceh

FADING PEDAL

(A Falling Away of Pedal Under Steady Foot Pressure)

I

PQRSTVW

GRABBING OR PULLING

ADEGHILN

RVW

aj

NOISE

(Squealing, Clicking or Scraping Noise)

GHIJKM

CHATTER OR SHUDDER

(May be Accompanied by Brake Roughness or Pedal Pumping)

GIKO

DRAGGING BRAKES

(Slow or Incomplete Release of Brakes)

ABCFGHKL RUVW

af

A—Pedal linkage—binding.

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 springs—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 dis-

torted.

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 damaged (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—Caliper pistons frozen or seized—worn or damaged seals.

W—Wheel or caliper cylinders—cups swollen, bores rough, or corroded, mismatched (Size).

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.

i—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.

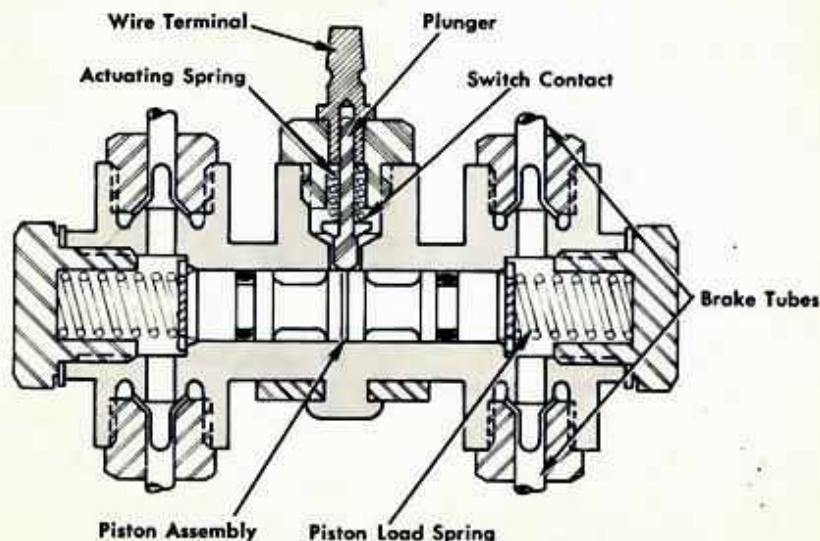


FIGURE 1—Warning Light Switch Assembly—Neutral Position

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 (Fig. 1).

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 (Fig. 2).

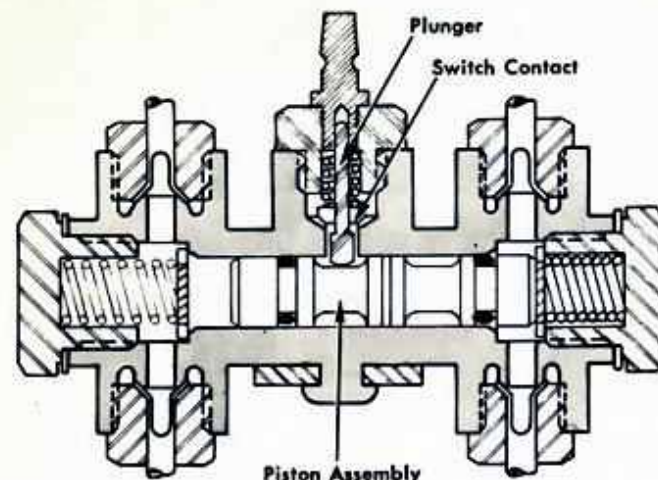


FIGURE 2—Warning Light Switch Assembly—Actuated by Pressure

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.

After correcting the hydraulic system problem and the brakes have been bled, 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.

TIRE SIZE	6.45 X 14	6.95 X 14	6.85 X 15	7.35 X 14	7.35 X 15	D-70	E-70
RAMBLER AMERICAN Six Cylinder							
Sedan, Hardtop							
Station Wagon	Std.	Opt. Std.	Export Opt.		Opt.	Opt.	
RAMBLER AMERICAN V-8 All							
JAVELIN							
Six Cylinder		Std.			Opt. Std.		Opt.
V-8							
TIRE SIZE	7.35 X 14	7.75 X 14	8.25 X 14	7.35 X 15	7.75 X 15		F-70
REBEL Six Cylinder							
Sedan, Hardtop, Convertible	Std.	Opt. Std.	Opt.	Opt.	Export Opt. Export Opt.		
Station Wagon							
REBEL V-8							
Sedan, Hardtop, Convertible	Std.	Opt. Std.	Opt.		Export Opt. Export Opt.		Opt.
Station Wagon							
AMBASSADOR Six Cylinder							
Sedan, Hardtop	Std.	Opt.	Std.		Export Opt.		
Station Wagon							
AMBASSADOR V-8							
Sedan & Hardtop		Std.	Opt. Std.	Std.	Export Opt.		Opt.
Station Wagon							

TIRE INFLATION PRESSURES

The recommended tire inflation pressures are listed as follows:

Pounds (P.S.I.), Cold before running. Do not reduce tire pressure if tires are warm.	(NORMAL INFLATION) Up to and Including Full-Load Service (Under 75 MPH)	
	Front	Rear
American and Javelin Sedans and Hardtops Station Wagons Convertibles	24 24 26	26 28 26
Rebel and Ambassador All (Except wagons) Station Wagons	24 24	26 28

Tire Loading, Selection and Pressure.

The original equipment 4-ply rated 2-ply 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.)

American and Javelin

All Models: 1075 lbs.

3 passengers, front seat
2 passengers, rear seat
175 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. Also, optional 8-ply rated 4-ply tires are offered when space does not permit the use of oversize tires. 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 for full-load service. 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 to values listed for "full-load service." 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 24 PSI (front and rear) for conditions up to and including five-passenger loads without luggage, and at speeds under 75 MPH.

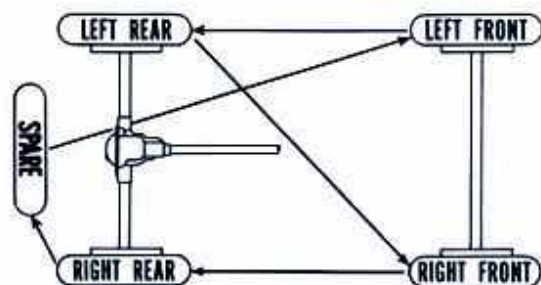
Tire Condition

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 8,000 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 on most tires. 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 8,000 miles is recommended to assure longer overall tire life by equalizing wear.

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



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 produced by 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 because the defective bearing will become noisy when loaded.

Rear Axle Tests

Lock out the overdrive, if so equipped, to eliminate the overdrive planetary gears.

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

The side bearings are lower in pitch because they are turning at the same speed as the wheels when the car is driven straight ahead. Side bearing noise will not vary when the car is turned alternately left or right or 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 side and pinion gears or a loose fitting differential pinion shaft in the case.

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

Other Axle Conditions

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

Differential side 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; this noise 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 ring and pinion gears at low mileages; then the need for bearing replacement is dependent upon inspection of the bearings during overhaul.

UNIVERSAL JOINT ANGLES

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.

Inspection Procedure

Raise the car so the car weight is supported by the rear springs.

Install 7" (seven) block between the top of each axle tube and the side sill, adjacent to the rubber bumper on each side of the car.

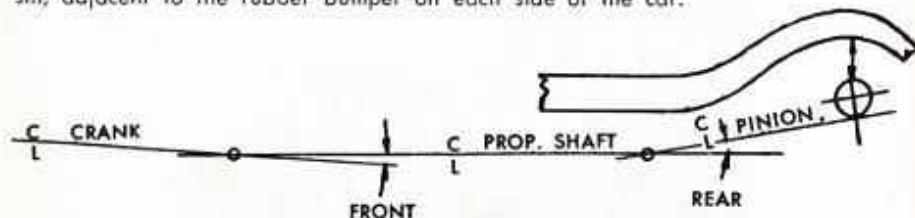


FIGURE 1—Front and Rear Universal Joint Angles

Using a bubble protractor or a protractor and plumb bob, measure the angle of the rear axle pinion at the machined boss (Fig. 2).



FIGURE 2—Measuring Angle at Pinion



FIGURE 3—Measuring Propeller Shaft Angle

Measure the angle of the propeller shaft (Fig. 3). The difference between joint angle. The rear angle must be the two angles is the rear universal $3\frac{1}{2}^\circ$.

Example: Distance between top of axle tube and sill 7"

Rear Axle Angle 87°

Propeller Shaft Angle $83\frac{1}{2}^\circ$

Difference or Rear Universal Joint Angle $3\frac{1}{2}^\circ$

Measure the engine angle at the oil pan flange surface (Fig. 4).



FIGURE 4—Measuring Engine Angle

The difference between the propeller shaft angle and the engine angle is the front universal joint angle. The front angle must be 1°.

Example: Distance between top of axle tube and sill is 7"

Example: Distance between top of axle tube and sill is 7"

Propeller Shaft Angle	83-1/2°
Engine Angle	82-1/2°
Difference or Front Universal Joint Angle	1°

Adjustment

Inspect engine support cushions, replace or shim to obtain correct front universal joint angle.

Shims are installed between the rear suspension upper control arm crossmember and the body side sills for adjustment of rear universal joint angle.

Adding shims raises the rear axle pinion reducing the rear universal joint angle.

Removing shims naturally will increase the rear angle.

NOTE: The total shim pack thickness may vary between each side on original production adjustment due to body variations. Maintain same shim differential when performing adjustment.

REAR AXLE RATIOS

	2.73:1 (15-41)	3.08:1 (13-40)	3.31:1 (13-43)	3.58:1 (12-43)
AMERICAN				
199 C.I.D. Engine				
Standard Transmission		Standard	Optional	Optional
Overdrive Transmission		Optional	Standard	Optional
Automatic Transmission				
Sedans & Hardtops				
Without Air Conditioning ...	Standard	Optional	Optional	
Automatic Transmission				
Sedans & Hardtops				
With Air Conditioning	Optional	Standard	Optional	
Automatic Transmission				
Station Wagons	Optional	Standard	Optional	
AMERICAN				
JAVELIN	2.37:1 (19-45)	2.73:1 (15-41)	3.08:1 (13-40)	3.31:1 (13-43)
232 C.I.D. Engine				
Standard Transmission			Standard	Optional
Automatic Transmission				
Except Rogue		Optional	Standard	Optional
Automatic Transmission				
Rogue (except export) ..	Standard		Optional	
REBEL—AMBASSADOR				
232 C.I.D. Engine	2.86:1 (15-43)		3.15:1 (13-41)	3.54:1 (11-39)
Standard Transmission			Standard	
Overdrive Transmission				Optional
Automatic Transmission			Standard	Standard

	2.86:1 (15-43)	3.15:1 (13-41)	3.54:1 (11-39)
ALL SERIES			
290 C.I.D. Engine			
Standard Transmission		Standard	Optional (Rebel— Ambassador only)
Overdrive Transmission			Standard (Rebel— Ambassador only)
Automatic Transmission			
4-Speed Transmission	Optional	Standard	Optional
JAVELIN—REBEL—AMBASSADOR			
343 C.I.D. Engine			
Automatic Transmission	Standard	Optional	
4-Speed Transmission		Standard	Optional

REAR AXLE ADJUSTMENT

	01—199-232 C.I.D. 70—232 C.I.D.	10-80—232 C.I.D. All 290-343 C.I.D.
Pinion Bearing Preload	15-25 In. Lbs.	17-28 In. Lbs.
Type of Adjustment	Shims	Collapsible Sleeve
Differential Side		
Bearing Preload .....	.004"-.009"	.005"-.010"
Type of Adjustment	Shims	Shims
Ring Gear to Drive		
Pinion Backlash .....	.006"-.009" (.008" Desired)	.006"-.009" (.008" Desired)
Type of Adjustment	Shims	Shims
Differential Case Flange Run-Out (Ring Gear Flange)		
Inspection Only—		
No Adjustment .....	.002" Total	.002" Total
Differential Side Gear		
to Case Clearance .....	.000"-.008"	.000"-.008"
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 C.I.D. 70—232 C.I.D.	10-80 (232) All 290-343
Rear Axle Housing Cover Screws	15	15
Rear Brake Support Plate	35	35
Rear Spring "U" Bolts (6801)	60	
Rear Spring Shackle Bolts (6801) (9/16"-18")	50	
Rear Spring Shackle Bolts (6801) (3/8"-24")	30	
Rear Hub to Axle Shaft Nut	250	250
Differential Bearing Cap	60	90
Ring Gear to Case Screw	50	70

TORQUE TIGHTENING SPECIFICATIONS (Continued)
—FOOT POUNDS

	01-199-232 C.I.D. 70-232 C.I.D.	10-80 (232) All 290-343
Drive Pinion Nut	190	
Wheel to Hub Nut	75	75
Rear Universal Joint "U" Bolts	15	15
Rear Axle Control Arms (6810-80)	60	60
Rear Axle Control Arm Crossmember Bolts (6810-80)	75	75
Rear Axle Pinion Yoke Nut	65	

FRONT WHEEL ALIGNMENT SPECIFICATIONS

Turning Angle	
Inside Wheel	25°
Outside Wheel	22°
Caster Angle	
01-70 Without Power Steering	-1/2° to +1/2°
01-70 With Power Steering	+1/2° to +1-1/2°
10-80 All	0° to -1°, -1/2° Desired
Camber	-3/8° to +3/8°
Toe-in	1/16" to 3/16"—1/8" desired

ADJUSTMENTS
Manual Steering Gear Adjustments—

Pitman Arm Disconnected—Measured in Pounds Pull at Steering Wheel		
Worm Bearing Preload	01-70	10-80
(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 End Play Clearance000"

FRONT WHEEL BEARING ADJUSTMENT

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	35
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	45
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	75
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

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 Owner Protective Maintenance Book provided with each car. The book 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 Book 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 4,000 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 Protective Maintenance Guide (listed as "W") and as listed in the Warranty; others should be performed as the need appears.

Services listed as "E—Required for Emission Control" are items necessary to maintain the Exhaust Emission Control Systems at the proper control level.

Services listed as "O"—Optional as Car Operation Service—are related to individual car use and driving conditions; for example, a brake inspection may be needed more often in stop-and-go use than in highway driving.

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

LUBRICATION**ENGINE OIL CHANGES**

The initial change of oil and oil filter unit should be made at 4,000 miles. As periods for subsequent drains are affected by a variety of conditions, no single mileage figure can apply to all types of driving. Under normally favorable conditions, draining at 4,000 mile intervals or every four (4) months, whichever first occurs is good practice. When changing oil, drain crankcase after engine has reached normal operating temperature to insure complete removal of used oil.

MILEAGE CHART

ENGINE OIL DRAIN	Every 4,000 Miles	Every 2,000 Miles	Every 1,000 Miles
Favorable Conditions— (Summer and Winter) (Over 10 miles average per trip.)	X		
Summer (Over 32° F. average.) Less than 10 miles average per trip.		X	
Winter (Below 32° F. average.) Less than 10 miles average per trip.			X
Predominantly Dusty Driving Conditions.			X
Change Oil Filter (every 2,000 miles in Predominantly Dusty Driving Conditions.)		X	

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-Viscosity	Recommended Multi-Viscosity
Above 32° F.	SAE 20W-20	SAE 10W-30
Above 0° F.	SAE 10W	SAE 10W-30
Below 0° F.	SAE 5W*	SAE 5W-20
*Sustained high speeds (above 65 M.P.H.) should be avoided when using SAE 5W 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 conditions 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.

The oil filter unit should be changed every four (4) months or 4,000 miles whichever first occurs. An additional quart of oil is required at this time.

TRANSMISSION LUBRICATION**Standard and Overdrive**

The oil level should be checked at 4,000 mile intervals. The oil level plugs are located on the right side of the transmission and/or overdrive case.

The oil should only drip out of the oil level holes after removing the plugs. If oil should run out in a steady stream, let the oil drain and when it stops dripping, replace the plug and tighten securely.

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)

Automatic Transmission Fluid Type A, "AQ-ATF" Suffix "A" (3-Speed)

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

"SHIFT-COMMAND" Automatic Transmission

Fluid level should be checked at 4,000 mile intervals.

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 or Type "A," "AQ-AFT" Suffix "A."

The location of the oil level dip stick is at the right rear of the engine.

Care must be exercised when checking the oil level. Therefore, the following procedure is recommended.

Start the engine and run until normal operating temperature is obtained (indicated by temperature gauge in instrument cluster).

Apply parking brake.

Place transmission in N (Neutral) position; carburetor must be off of fast idle.

Move selector lever through all drive ranges and into reverse to N (Neutral) position. The above should be done with foot on brake to prevent car from moving.

Insert dip stick and again remove and check oil level on stick. Oil level should show even on full mark. The quantity of fluid required to raise the fluid level from the L mark on the dip stick to the F mark is approximately 1-1/2 pints.

NOTE: If the fluid level is low when checked and there are indications of fluid leakage, correction should be made to eliminate all leaks.

No regular drain or refill intervals recommended, only at time of major service. Check level at 4,000 mile intervals.

Drain and Refill Procedure:

The fluid must be drained from the transmission case after operation before the fluid has a chance to cool.

Drive car on lift or over pit. Remove the transmission case filler tube located at the right hand side of the oil pan.

After the oil is completely drained, replace the oil filler tube.

Pour 5 Quarts of Automatic Transmission Fluid in the transmission and set the parking brake. Start the engine and turn it with selector level in the N (Neutral) position. Add 3 Quarts of oil and move the selector through all ranges, return to N (Neutral) position. Check the oil level with the dip stick after the transmission has attained normal operating temperature (approximately 190° F), and, if necessary, add oil to bring the fluid to the F mark on the dip stick.

The oil capacity when filled to the F mark is approximately 9 Quarts for the 199-232-290 C.I.D. Engines, 10 Quarts for the 343 C.I.D. Engine.

CAUTION: Do not overfill transmission—Overfilling will cause foaming when the transmission is warm.

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 #80 (use SAE 90 if 80 is not available) Gear Lubricant of API-GL-4 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.

Check oil level every 4,000 miles. Regular drain and refill periods are not required.

FRONT SUSPENSION**Rebel and Ambassador**

The upper control arm trunnion bushings are to be lubricated at 24,000 mile intervals. At every lubrication, remove the plug from each trunnion bushing and lubricate using manual gun and hose, Tool No. J-9669, with Special Chassis (Sodium Base) cartridge Lubricant. (Gun and cartridge identified with red label.)

NOTE: Remove one plug at a time, lubricate, and replace the plug before moving to next fitting. This will purge old lubricant from both bushings. The lower section of the upper spring seat column provides a lubricant reservoir with a relief valve.

Under severe driving conditions, such as wet, snow, and mud, the bushings should be inspected every 12,000 miles or one year, whichever first occurs and lubricated if required.

All Series

The lower ball joint assemblies are to be lubricated at 24,000 mile intervals. At every lubrication, remove the plug in bottom of each assembly and lubricate using low pressure manual gun with Chassis (Lithium Base) Lubricant or Multi-Purpose Chassis Lubricant.

After lubrication, install plugs in ball joint assemblies.

Under severe driving conditions, such as wet, snow, and mud, the ball joints should be inspected every 12,000 miles or one year, whichever first occurs and lubricated if required.

STEERING LINKAGE BALL JOINTS**All Series**

The steering linkage ball joints are to be lubricated every 24,000 miles interval, under ideal or normal driving conditions. A plug is provided for inspection and lubrication. Lubricate with Lithium Base Chassis Lubricant. Under severe driving conditions, such as wet, snow, and mud, the ball joints should be inspected every 12,000 miles or one year, whichever first occurs and lubricated if required.

CLUTCH IDLER LEVER INNER AND OUTER PIVOTS**American, Rebel, and Ambassador Series**

Lubricate at 24,000 mile intervals.

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

Install plug after lubrication.

American and Javelin Series (199-232)

Lubricate at 24,000 mile interval.

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

POWER STEERING RESERVOIR

No regular drain or refill intervals recommended, only at time of overhaul or other service. Check level at 4,000 miles. 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

Check level 4,000 miles, 1/4" from top. Add or refill with SAE 70-R-3 heavy duty

hydraulic brake fluid for Standard Brakes, American Motors Part Number 8991860 for Disc Brakes.

FRONT WHEEL BEARINGS

Wheel Bearing Lubricant: 24,000 mile intervals.

REAR WHEEL BEARINGS

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

STEERING GEAR

No regular drain or refill intervals recommended, only at time of overhaul or other service. Check level at 4,000 mile intervals. Add chassis lubricant (less Power Steering) if required.

EXHAUST MANIFOLD DAMPER (Control Valve)

Use Part Number 8991632—Special Lubricant.

PARKING BRAKE LINKAGE

"Lubriplate."

ACCELERATOR LINKAGE

Engine Oil.

DISTRIBUTOR CAM

Distributor cam grease at overhaul or contact point set replacement.

Rotate distributor cam lubricator 1/2 turn on Six Cylinder Models—V-8, turn end for end every 12,000 miles. Replace distributor cam lubricators every 24,000 miles.

BODY LUBRICATION

Door & Window Weather Strips	Clean sealer rubbers. Apply silicone oil (A.M. Silicone Lub. Spray).
Key-Lock Cylinders	Apply silicone oil to key and insert 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.
Convertible Top Pivot Points	Lightly apply engine oil.

CAPACITIES

U.S.A.

British Imperial

Quarts

CRANKCASE

All Engines	4	3.3
(Add 1 Qt. with Filter Change)		



COOLING SYSTEM

Quarts

199, 232	10.5	8.7
Less Heater	9.5	7.9
290	14	11.7
Less Heater	13	10.8
343	13	10.8
Less Heater	12	10.0



TRANSMISSIONS

Pints

3-Speed		
199, 232	1.5	1.25
290	2.5	2.1
Overdrive		
199, 232	2.75	2.3
290	3.75	3.1
4-Speed		
290, 343	3.5	2.9

Quarts

Shift Command		
199, 232, 290	9	7.5
343	10	8.3



DIFFERENTIAL

Pints

232 (01-70), 199	3	2.5
290 (01-70), 232, 290, 343—(10, 80)	4	3.3



GAS TANK

Gallons

01-70	16	13.3
10 and 80	21.5	17.9
10-80 (3-Seat Wagon)	19	15.8



**Protective
Maintenance**

*Service that's so good
you help us sell cars*