

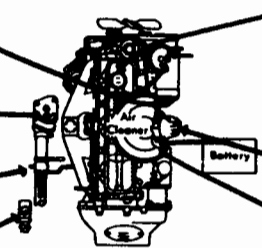


# Lubrication Chart

LUBRICATE AT EACH ARROW POINT EVERY 1,000 MILES — except as noted  
 USE ESSO MULTI-PURPOSE GREASE H or ESSO CHASSIS GREASE  
 unless otherwise specified

## UNDER HOOD

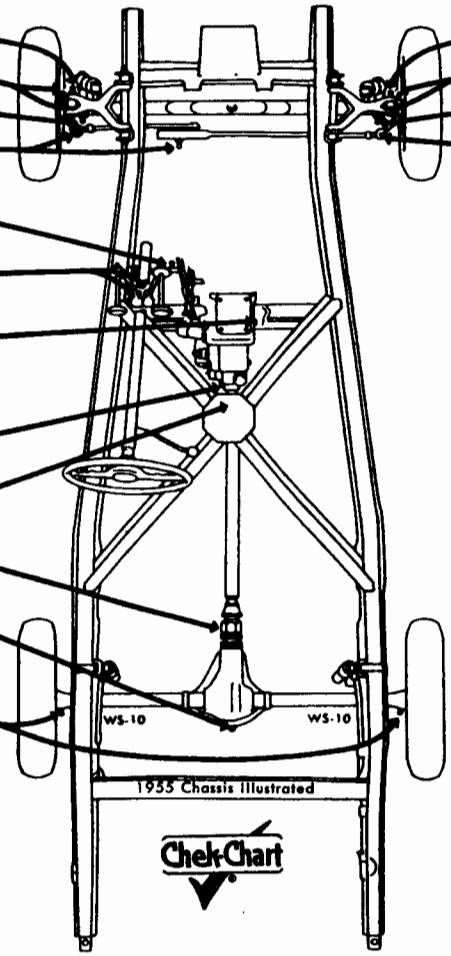
- Generator (2 oilers)..... SAE 10W **MO**  
Lubricate sparingly
- Steering Gear (plug)..... SAE 140 **XP**
- Remote Control Gearshift..... fitting
- Brake Master Cylinder (check level).... **HB**



- CRANKCASE**..... **MO**
  - Esso
  - Above +90° ..... 10W-30 3 30
  - Not lower than +10°... 10W-30 1 20W
  - Not lower than -10°... 10W-30 1 10W
  - Below -10° ..... 5W-20 — —
  - See page 3 for drain and refill intervals
- Oil Fill Cap (F-head mod.)... Crankcase gr. **MO**
- Distributor Shaft (oiler).... SAE 10W **MO**
- Wick under rotor..... SAE 10W **MO**  
Lubricate shaft and wick sparingly
- Starter (covered oil hole)..... **MO**  
1946-49 and some 1950 models. Others, no lubrication

## UNDER CHASSIS

- Upper Control Arm Pin..... fitting
- King Pin ..... 2 fittings
- Spring Pivot Bolt..... fitting
- Tie Rods ..... 2 fittings
- Clutch Control Shaft..... fitting  
Not on 1946-51 and some 1952 models
- Clutch and Brake Pedals..... 2 fittings
- TRANSMISSION** (check level)  
Conventional and Overdrive..... **XP**  
Above +32°, SAE 90; below +32°, SAE 80  
Overdrive drained and filled through separate plugs  
Drain and refill every 10,000 miles or twice yearly
- Universal Joint ..... fitting  
Cross type. Use low pressure gun
- Universal Joint Spline..... fitting  
On models with cross type joint
- Universal Joint ..... fitting  
Cross type. Use low pressure gun
- DIFFERENTIAL** (check level)..... **XP**  
All temperatures ..... SAE 90  
Drain and refill every 10,000 miles or twice yearly
- Rear Wheel Bearings (2 fittings)..... **MG**  
Apply sparingly until lubricant appears at vent hole above fitting



- Upper Control Arm Pin..... fitting
- King Pin ..... 2 fittings
- Spring Pivot Bolt..... fitting
- Tie Rod ..... fitting

### DO NOT LUBRICATE

- UNDER HOOD** Fan, Water Pump
- UNDER CHASSIS** Clutch Release Bearing, Rear Spring Bolts and Shackles, Shock Absorbers, Shock Absorber Mounting Bushings, Springs

### SPECIAL MILEAGE SERVICES

- 4,000 Miles**  
OIL FILTER (1953-55, if equipped) Install new Atlas element
- 5,000 Miles**  
HAND BRAKE CABLES..... **MG**  
TRANSMISSION OVERDRIVE CONTROL CABLE. **MG**  
Remove cable from conduit  
WINDSHIELD WIPER CONTROL CABLE..... **MG**  
Located back of instrument panel
- 10,000 Miles**  
FRONT WHEEL BEARINGS ..... **MG**  
Repack at least once a year  
SPEEDOMETER CABLE ..... **MG**
- 10,000 Miles or Twice Yearly**  
DIFFERENTIAL Drain and refill..... **XP**  
All temperatures, SAE 90  
TRANSMISSION Conventional and Overdrive. **XP**  
Above +32°, SAE 90; below +32°, SAE 80  
(drain and refill)
- 20,000 Miles**  
UNIVERSAL JOINTS Repack..... **MG**  
Ball and trunion type

### Conditional Services

- AIR CLEANER ..... **MO**  
Service if necessary at chassis lubrication interval  
Carburetor, oil bath Crankcase grade  
Carburetor, wire gauze Crankcase grade

### TIRE PRESSURES

SIZE	Front	Rear
6.00, 6.50-15, 4 ply	24	28
6.00-15, 6 ply	26	36
6.50-15, 6 ply	24	32
All others	24	24

### KEY TO ESSO LUBRICANTS

- HB** Atlas Brake Fluid, Heavy-Duty
- MG** Esso Multi-Purpose Grease H
- MO** Uniflo Motor Oil, Esso Extra Motor Oil or Esso Motor Oil
- XP** Esso XP Compound

### TABLE OF CAPACITIES

MODEL	CRANK-CASE Quarts	TRANSMISSION		DIFFERENTIAL Pints	COOLING SYSTEM		GAS TANK Gallons
		Conventional Pints	With Overdrive Pints		With Heater Quarts	Without Heater Quarts	
4 cyl.	4	1 1/2	2 1/4	2	12	11	15
6 cyl., '52-'55	5	1 1/2	2 1/4	2	12	11	15
6 cyl., others	5	1 1/2	2 1/4	2	11*	10*	15

\* 1948 and early 1949, 9 1/2 quarts      • 1948 and early 1949, 8 3/4 quarts

FOR DETAILED PROCEDURES, REFER TO "SERVICE INSTRUCTIONS" SECTION PRECEDING THE LUBRICATION CHARTS

**WILLYS • 1946 thru 1955** STATION WAGON, STATION SEDAN,  
 SEDAN DELIVERY, JEEPSTER

# WILLYS Four 1949

Model 4-63 Station Wagon  
Model VJ-2, VJ-3 Jeepster

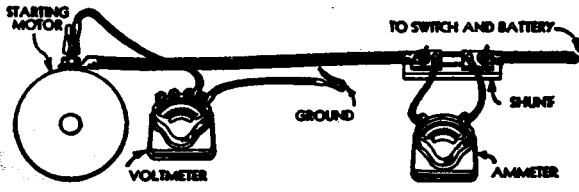
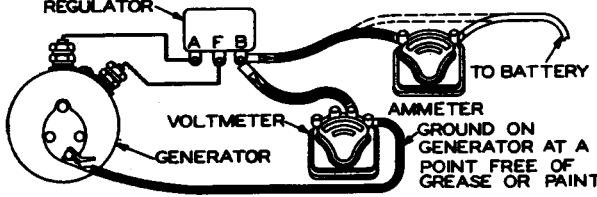
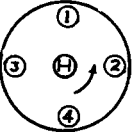
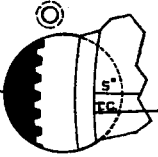
Serial No. (see below) U.S. \* \*

## A. E. A. TUNE UP SYSTEM

## Standards of Adjustment Automotive Electric Association

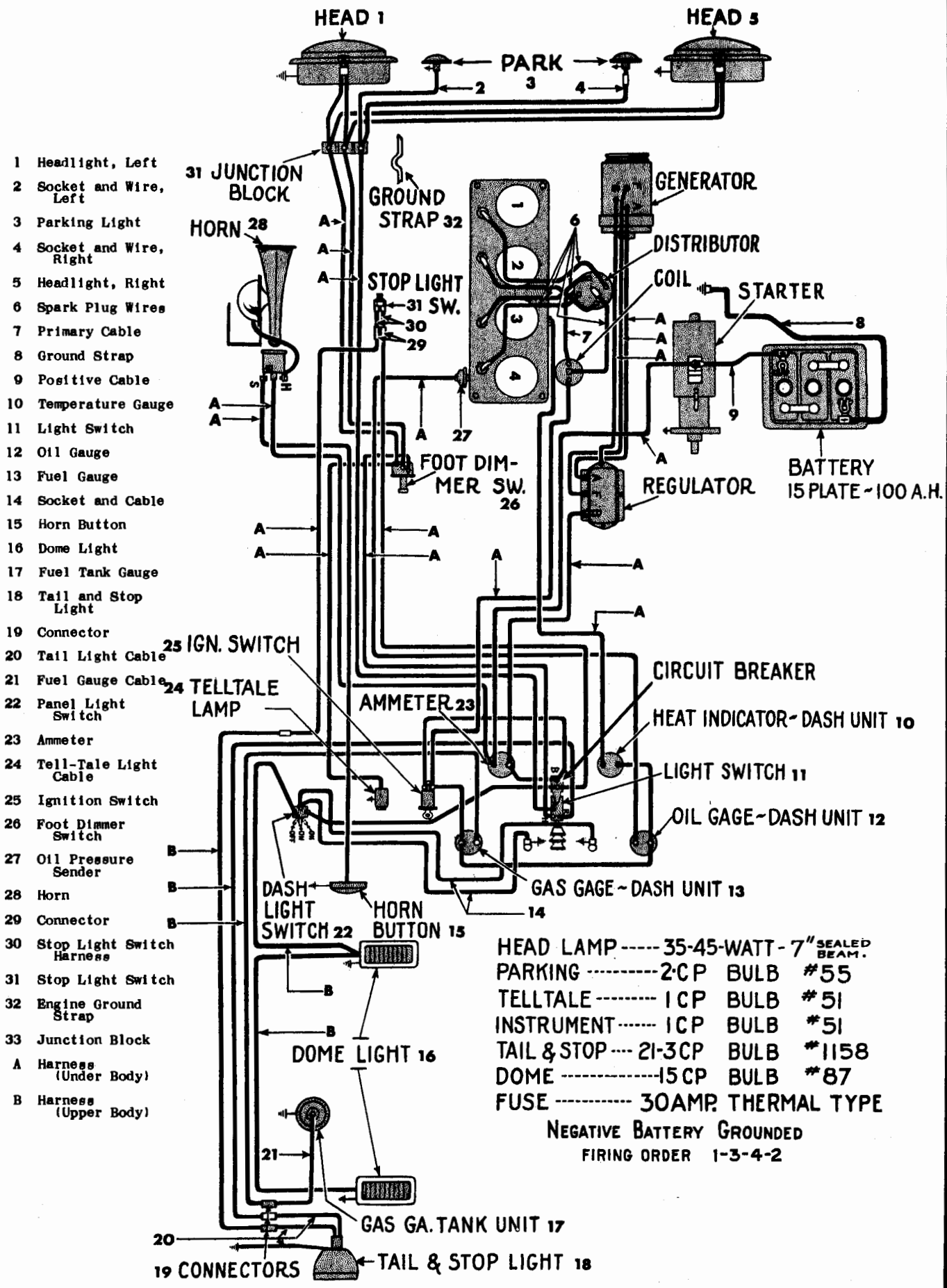
Issued August 1949

Form No. WI-23

<p><b>BATTERY &amp; CABLES</b></p> <p>WILLARD Type HW-1-100 CAPACITY - 100 Amp. Hour (20 hr. rate) LOCATION - Under hood right side. Negative Ground CABLES - AUTO-LITE - Battery to Ground Cable - Length 37"; Gauge No. 1; Part No. 37C. Battery to Switch Cable Length 18"; Gauge No. 1; Part No. 19F.</p>	<p><b>COMPRESSION - MANIFOLDS</b></p> <p>Manifold Heat Control - Thermostatically operated. Make sure valve operates freely. VALVE CLEARANCE - Hot or Cold - Intake - .016" Exhaust - .016" VALVE TIMING - Intake valves open at 9° before top center. TAPPET LASH for checking valve timing: .020" (Cold).</p>	<p><b>CARBURETOR</b></p> <p>CARTER - Model WA-I 613S Single Downdraft Float Level - 5/16" from seam of float (at free end) to tip on lower edge of float chamber cover, when needle is seated. Accelerating Pump Adjustment - 11/64" plunger travel (full throttle position). Use gauge T109-117S. Fixed Jets - Metering Rod - Standard Part No. 75-589 Metering Rod - 1 Size Lean Part No. 75-601 Metering Rod - 2 Sizes Lean Part No. 75-618 Metering Rod Jet Assembly Part No. 120-678 Metering Rod Adjustment - .005" clearance between metering rod pin and shoulder in notch of gauge. Idle Engine Speed - 1/2 to 1-1/2 turns open. For richer mixture turn screw out. Do not idle below 600 R.P.M.</p> <p>ZENITH 228AV10 0-10780 Float Level - 45/64" plus or minus 1/32" from top of float seam to face of carburetor body. Accelerating Pump Adjustment - 3/4 stroke - center notch in rod. Fixed Jets - Main Jet Part No. C52-7-28 Idle Jet Part No. C56-3-12 Well Vent Jet Part No. C77-14-28 Discharge Jet Part No. C66-70-2-80 Idle Engine Speed - Approximately 1 turn off seat. For richer mixture turn screw out. Idle at 10 M.P.H. or 800 R.P.M.</p>
<p><b>STARTING MOTOR</b></p>  <p>AUTO-LITE No. MZ-4137 Drive - Overrunning Clutch Part No. AUTO-LITE MAX-3098 FREE RUNNING SPEED - 4300 Min. R.P.M. 70 Max. Amps. 5.5 Volts LOCK TORQUE (STALLED) - 4.4 Ft. Lbs. 280 Amps. 2.0 Volts STARTING SWITCH - Part No. SW-2877A</p>	<p><b>SPARK PLUGS</b></p> <p>AUTO-LITE No. A-7; CHAMPION Type J7 Gap .030" Use Round Wire Gauge Size 14mm.</p>	<p><b>COOLING SYSTEM</b></p> <p>Capacity - 11 Quarts (U.S. Measure) Thermostat - Top of cylinder head. Opens at 154° F.</p>
<p><b>GENERATOR</b></p>  <p>AUTO-LITE No. GDZ-4817A Brush Spring Tension - 35-53 oz. with new brushes Maximum Controlled Output: Cold - 35 Amps. 8.0 Volts at 1800-2000 R.P.M. Gen. Rotation - Clockwise (viewing drive end) Regulation - Current and Voltage Regulator Out-Out Relay - Combined with Regulator</p>	<p><b>IGNITION COIL</b></p> <p>AUTO-LITE No. IG-6009 Servicing Coil No. IG-6009 Mounting Bracket on Coil</p>	<p><b>WINDSHIELD WIPER - HORN</b></p> <p>Windshield Wiper - TRICO Station Wagon Service Motor No. CSM-1-3 Wiper Arm (Both sides) AL 80 Blade (Both sides) WLA-778-40C Linkage (Driver side) G-81490 (Pass. side) G-81489</p> <p>Jeepster Service Motor No. CSM-1-2 Wiper Arm (Both sides) AL 80 Blade (Both sides) WLA-778-40C Linkage (Driver side) G-82557-C (Pass. side) G-82558-C</p> <p>Horns - AUTO-LITE No. HW-4007 Low Pitch No. HW-4008 High Pitch</p>
<p><b>GENERATOR REGULATOR</b></p> <p>AUTO-LITE No. VRP-4007C-2 Current - Voltage Regulator - Connect ammeter in series with the "B" terminal and its lead. Connect voltmeter from "B" terminal to ground. Have regulator warm from operation. Take voltage readings at 9 toll amperes output and current readings at 8.9 to 7.1 volts. Circuit breaker air gap - .031" - .034"; circuit breaker contact gap - .015" minimum. Circuit breaker closes at 8.4-7.0 volts; opens at 4.1-4.8 volts. Current and voltage regulator armature air gap - .048" - .052". Voltage regulator operates at 7.2-7.5 volts. Current regulator operates at 34-36 amps.</p>	<p><b>HIGH TENSION CABLES</b></p> <p>Ignition Cable Set - AUTO-LITE No. 4UB</p> <p><b>DISTRIBUTOR</b></p>  <p>AUTO-LITE No. IGW-4189 Firing Order - 1-3-4-2 Breaker Contact Gap - .020" Breaker Contact Set Part No. IGW-30289 Breaker Arm Spring Tension - 17-20 oz. Condenser - Part No. IGB-1025 Capacity - .20 - .25 Mfd. Automatic Advance - Start 0° at 350 R.P.M.; Intermediate 2° at 560 R.P.M.; Maximum 11° at 1500 R.P.M. (Distributor degrees at distributor R.P.M. Tolerance + or - 1°). Vacuum Control - No. VC-4010 2.5" - 4.5" hg. to start plunger travel; 9° - 11° distributor advance at 15" hg. maximum advance.</p>	<p><b>ADDITIONAL SPECIFICATIONS</b></p> <p>Gauges - KING-SEELEY Temperature Gauge - Dash Unit No. 42576 Motor Unit No. 7000 Oil Pressure Gauge - Dash Unit No. 42585 Motor Unit No. 40787 Gasoline Gauge - Dash Unit No. 42570 Tank Unit No. 41285</p> <p>Ammeter - No. 42580 Speedometer - KING-SEELEY No. 43205 Crankcase Capacity - 4 Quarts (U.S. Measure) Recommended Tire Pressure - 6.70 x 15 - 20 lbs. front; 24 lbs. rear Ignition Lock - BRIGGS &amp; STRATTON Key Series C250 - 499 Key Blank Part No. 42164 Lock Part No. 50184 Over Drive Solenoid Control - DELCO-REMY No. 1118132 Contact opening on case and coil assembly - .022" - .040" when plunger is held against stop. Current Draw: Both windings - 26.2-28.4 amps. at 5 volts Hold-in winding - 1.2-1.4 amps. at 5 volts * * Serial Number - (4-63) On floor riser, back and left of driver. (VJ-2, VJ-3) Under edge of cowl above glove compartment door. 10001 and up (U.S.) Engine Number - Top of cylinder block back of water pump. U10001 and up (U.S.)</p>
	<p><b>IGNITION TIMING</b></p> <p>USE TIMING LIGHT - Breaker contacts to open for No. 1 cylinder at 5° before top center</p> 	
	<p><b>FUEL PUMP</b></p> <p>AC - Combination Fuel and Vacuum Pump Type 9306 Capacity - 1 pint or over in 1 minute Pressure - 2-1/2 lbs. minimum; 3-1/2 lbs. maximum Vacuum Test - 8" hg. minimum at 120 R.P.M. 10-1/2" hg. maximum at 1800 R.P.M.</p>	
	<p><b>AIR CLEANER</b></p> <p>OAKES - No. 616615</p> <p><b>NOTE:</b> The SYMBOL "hg. used on this chart designates "Inches Vacuum" (mercury). Original equipment service parts and accurate work to manufacturers' specifications with proper tools and equipment will restore original performance.</p>	



# WIRING DIAGRAM



- 1 Headlight, Left
- 2 Socket and Wire, Left
- 3 Parking Light
- 4 Socket and Wire, Right
- 5 Headlight, Right
- 6 Spark Plug Wires
- 7 Primary Cable
- 8 Ground Strap
- 9 Positive Cable
- 10 Temperature Gauge
- 11 Light Switch
- 12 Oil Gauge
- 13 Fuel Gauge
- 14 Socket and Cable
- 15 Horn Button
- 16 Dome Light
- 17 Fuel Tank Gauge
- 18 Tail and Stop Light
- 19 Connector

- 20 Tail Light Cable
- 21 Fuel Gauge Cable
- 22 Panel Light Switch
- 23 Ammeter
- 24 Tell-Tale Light Cable
- 25 Ignition Switch
- 26 Foot Dimmer Switch
- 27 Oil Pressure Sender
- 28 Horn
- 29 Connector
- 30 Stop Light Switch Harness
- 31 Stop Light Switch
- 32 Engine Ground Strap
- 33 Junction Block
- A Harness (Under Body)
- B Harness (Upper Body)

HEAD LAMP ----- 35-45-WATT - 7" SEALED BEAM.  
 PARKING ----- 2-CP BULB #55  
 TELLTALE ----- 1CP BULB #51  
 INSTRUMENT ----- 1CP BULB #51  
 TAIL & STOP ---- 21-3CP BULB #1158  
 DOME ----- 15CP BULB #87  
 FUSE ----- 30AMP THERMAL TYPE  
 NEGATIVE BATTERY GROUNDED  
 FIRING ORDER 1-3-4-2