



INDUSTRIAL TRUCK DIVISION



OPERATORS MANUAL

FOR
CLARKTOR
120 - 120 B

1ST REVISION
0-175

CLARK EQUIPMENT COMPANY

PUBLISHED BY

TECHNICAL SERVICE DEPARTMENT,
BATTLE CREEK, MICHIGAN, U.S.A.

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SPECIFICATIONS

GENERAL

Type of vehicle.....Towing Tractor

Single Drive

Tread steer tires.....59 5/8"

Dual Drive

Tread outside rear tires....80 7/8"

Tread inside rear tires....58 1/8"

Turning radius, outside.....127"

Turning radius, inside.....18 1/2"

Ground clearance - under counterweight tow hitch or mounting.....8"

Ground clearance - under rear axle.....9"

Ground clearance - under front axle.....6 3/4"

Ground clearance between axles.....8"

Grade clearance.....42%

Draw bar pull.....12000# at 12" coupler height.

Draw bar pull (loaded) 1st gear 12000# at 0 MPH

Travel speeds:

Empty: 1st.....2.5 MPH

2nd.....4.5 MPH

3rd.....8.5 MPH

4th.....15 MPH

Gradeability:

Low gear: 42% @.9 coefficient of friction

ENGINE (Make: Chrysler. Model: Industrial)

Model.....IND32-1563

Type.....L-Head

Number of cylinders.....6

Bore.....3 7/16

Stroke.....4 3/4

Displacement.....265

Governed Speed (No Load)....3350-3400 RPM

Bare Engine H.P.at Governed RPM..117@3200

Maximum torque.....225 @ 1200 RPM

Governor setting (loaded).....3200 RPM

Firing order.....153624

Crankcase capacity:

With filter.....6 Quarts

Without filter.....5 quarts

FUEL TANK CAPACITY.....25 Gallons

COOLING SYSTEM CAPACITY.....20 Quarts

FAN BELT DEFLECTION.....1/4 to 1/2

CLUTCH (Make: Borg & Beck)

Outside diameter.....11"

Clutch pedal free travel.....approx. 3/4"

Clutch throwout bearing.....

Permanent type, greased for life

FLUID COUPLING

Capacity.....13 Pts

TRANSMISSION (Make: Clark, Model: 185F)

Speeds.....4

Gear ratio: First.....6.35 to 1

Second.....3.31 to 1

Third.....1.73 to 1

Fourth.....1.00 to 1

Reverse.....7.54 to 1

Capacity.....4 Quarts

STEER AXLE

Axle Alignments:

Toe-in.....0 degrees

Camber angle.....1 degrees

Caster.....0 degrees

Left-hand turning radius angle:

Left wheel.....40 degrees

Right wheel.....67 degrees

Right-hand turning radius angle:

Left wheel.....67 degrees

Right wheel.....40 degrees

DRIVE AXLE

Ratio.....23.35 to 1

Differential capacity.....14 Pints

Wheel end capacity.....8 Pints

(each end)

WHEELS AND TIRES

Size:

Front (steer).....7.50X15

Rear (drive).....8.25X20

Air pressure:

Front (single drive).....55 lbs.

Rear (dual drive).....55 lbs.

SPLIT RIM WHEELS (Standard or Optional)

Torque wheel nuts.....450-500 lbs.

Drive wheel.....450-500 ft. lbs.

(Both dry thread)

Steer wheel 450-500 ft. lbs. (Dry thread)

Steering gear pitman arm lock nut torque

.....100-125 ft. lbs.

Steering gear mounting bolts and clamp

bolt torque.....47 ft. lbs.

BRAKE SYSTEM

Type: Hydraulic/Hydraulic Vacuum Booster.

Brake pedal free travel.....1/2-3/4

(As measured from top pedal position to

where pedal meets resistance from the

master cylinder.)

DISTRIBUTOR

Make.....Autolite AR-80

Rotation.....Clockwise

Advance Control.....Automatic

Drive.....Camshaft Gear

Bushings.....2 Absorbent Bronze

CONDENSER CAPACITY (microfarads).....23 to .26

POINT GAP (in.)......018 to .020



INDUSTRIAL TRUCK DIVISION



OPERATIONS

TO MOVE A LOAD

The forks should be adjusted sidewise on fork bars to obtain maximum balance in proportion to width of load. Raise or lower forks to proper level and center the load as nearly as possible on the forks. Tilt upright assembly slightly backward to prevent the load from falling, accelerating engine slightly at the same time. Back away from stack.

Adjust the forks with load so they are close to the floor or ground but high enough to avoid hitting obstructions. The operator should have clear vision ahead when moving in a forward direction. When this is not possible, the operator should drive in reverse and sufficiently turn in his seat to obtain clear vision backward.

When the load is to be deposited, enter the area squarely, especially when placing one load on top of another, in order that all piles will be square and secure. Place load directly over desired area and slowly lower to the floor.

IMPORTANT

EVERY 8 OPERATING HOURS (OR EVERY SHIFT) ELEVATE UPRIGHT TO THE UPPER LIMIT. THIS WILL PROVIDE LUBRICATION TO THE TOP PORTION OF THE LIFT CYLINDER.

SAFETY AND OPERATION SUGGESTIONS

The use of industrial powered trucks is subject to certain hazards that cannot be overcome by purely mechanical means. The exercise of intelligence, care and common sense by the truck operator is necessary to eliminate the hazards of overloading, slipping and falling of the load; obstructions in the path of travel, or the use of equipment for a purpose for which it is not intended or designed.

The following are a few suggestions that should be followed in the operation of this machine.

1. Operate machine with forks close to floor, loaded or empty, but high enough to avoid hitting obstructions.
2. If vision is obstructed by the load, operate machine in reverse and sufficiently turn in the seat to obtain clear vision.

3. Avoid sudden stops or starts. When backing, be sure to look for fellow workmen before moving machine.
4. Drive carefully at all times. Exercise caution at cross aisles. Sound horn for safety.
5. Be sure loads are safe to move. Have loads properly centered on machine. Refer to the Capacity Chart in Specifications for various load center ratings.
6. An operator should be assigned to a specific machine.
7. The operator should be qualified and drive in accordance with his company's safety rules.
8. If the machine does not respond immediately, report to designated individual in charge. A minor adjustment now may save a major repair later.
9. Do not allow riders or hitchhikers.
10. Operate the machine at a safe distance behind other vehicles.
11. Do not operate machine with wet or greasy hands.
12. Observe highway traffic laws in the operation of the vehicle in the plant.
13. Drive carefully on wet or slippery floors.
14. Keep feet within running line of truck.
15. Observe the Operating Rules and Preventive Maintenance Instructions ASA B56.1 Safety Code for Powered Industrial Trucks.
16. Avoid overloading the truck -- this is a safety measure against possible injury to the driver and fellow workmen. Overloading shortens the life of the truck and increases maintenance.
17. Do not operate machine for prolonged periods in an unventilated area. All engines produce poisonous carbon monoxide gas as a by-product of combustion and can be dangerous if allowed to accumulate in a closed area.
18. Be sure the brakes are in proper working condition. Be sure all mechanical and electrical components are working correctly.

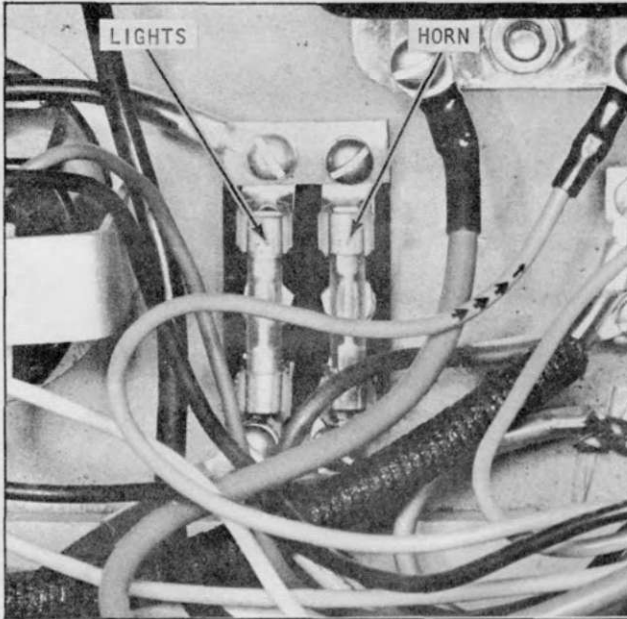


Plate 8597. Electrical System Fuses

HORN

Check to be sure the horn is working properly.

FUEL TANK

Check fuel supply and fill if necessary. Use a good grade of fuel. Before filling fuel tank, make certain the filler cap screen is in place and not damaged (on machines so equipped.)

LIGHTS

Check head lights and tail lights to be sure they are working properly.

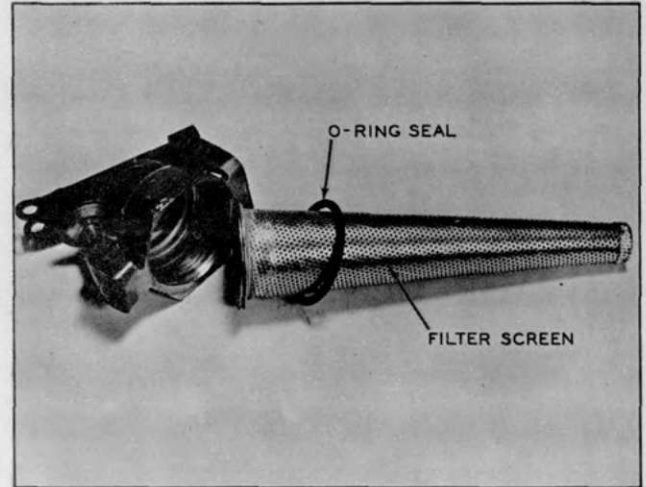


Plate 6627. Gasoline Tank Filler Cap & Screen

TIRES

Check for proper inflation.

Front.....55 lbs.
Rear.....55 lbs.

FUSES

Check the electrical circuit fuses. The fuse holder is located under the engine hood and behind the instrument cluster.

W A R N I N G

DO NOT FILL THE TANK WITH THE FILLER CAP SCREEN REMOVED. (GASOLINE MODELS)



Plate 5985. Air Cleaner
Fill to oil level only.

AIR CLEANER (OIL BATH TYPE)

The air cleaner is of the oil bath type. The main function of the air cleaner is to prevent dirt and grit from getting into the engine. All engines, when operating, consume several thousand cubic feet of air per hour. Since dusty air is full of abrasive matter, the engine will soon wear excessively if the air cleaner does not remove the dust before entering the cylinders.

Operating conditions determine the air cleaner service periods. As the dirt is strained from the air flowing through the cleaner, it thickens the oil in the cup and raises the level. If the level is too high, agitation of the oil on the screen is affected and gritty oil is carried over into the air stream, through the carburetor and into the engine cylinders. This would actually introduce a grinding compound with resulting very rapid wear.

Air cleaner maintenance may seem trivial, but it can mean longer engine life, less engine up keep and better economy providing proper maintenance is exercised. Common sense with a close observance can best determine the frequency of air cleaner maintenance.

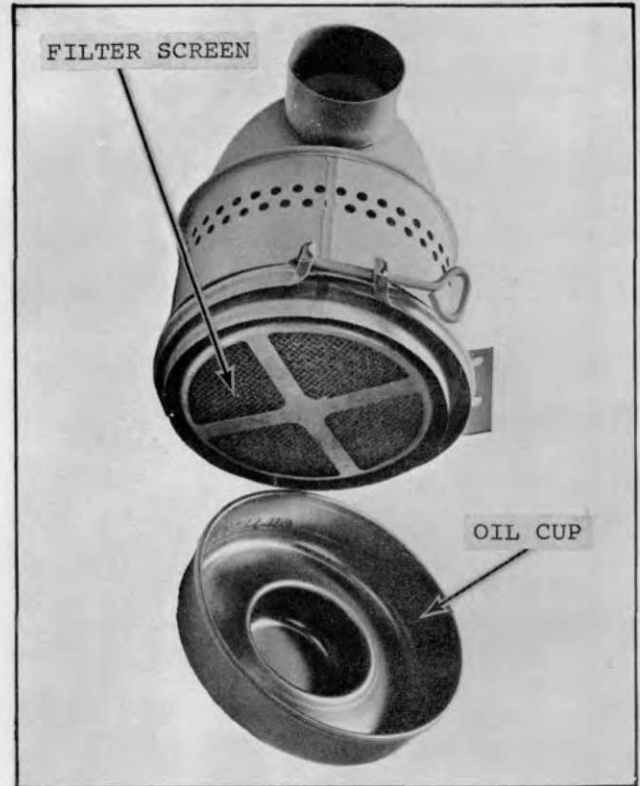


Plate 7663. Air Cleaner Screen and Oil Cup.

RECOMMENDED MAINTENANCE

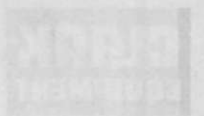
The air cleaner should be checked every 8 operating hours and cleaned if needed. This may be necessary twice daily under extreme dirty conditions.

Remove air cleaner oil cup and wash in a Stoddard type cleaning solvent. Wipe dry and refill with new engine oil. Replace oil cup on air cleaner being sure it is properly positioned.

Check all hose connections to be sure they are tight. Periodically remove hose connections and check interior of hose for dirt or dust. If found, this indicates that additional cleaning intervals are necessary.

CAUTION

ALWAYS CHECK AIR CLEANER ASSEMBLY WITH THE ENGINE TURNED OFF. NEVER CHECK OR REFILL THE OIL CUP WITH THE ENGINE OPERATION.



FRONT PEDAL FREE SWAYE LOCK

Using a scale, measure pedal free travel. Clearance should be measured from top of pedal position to where pedal meets resistance from the master cylinder. Pedal free travel of 10 mm (3/8") is normal. When pedal meets resistance from the master cylinder, the distance traveled should be 100 mm (4") or less. If free travel is too great, adjust as follows:

1. Loosen lock nut.
2. Rotate adjuster to obtain specified pedal free travel.
3. Tighten lock nut to hold adjustment.

ACTUATOR STROKE

If brake pedal travels beyond point B, it indicates either lack of fluid in the master cylinder, air in the system or the brake linkage requires adjustment or replacement.

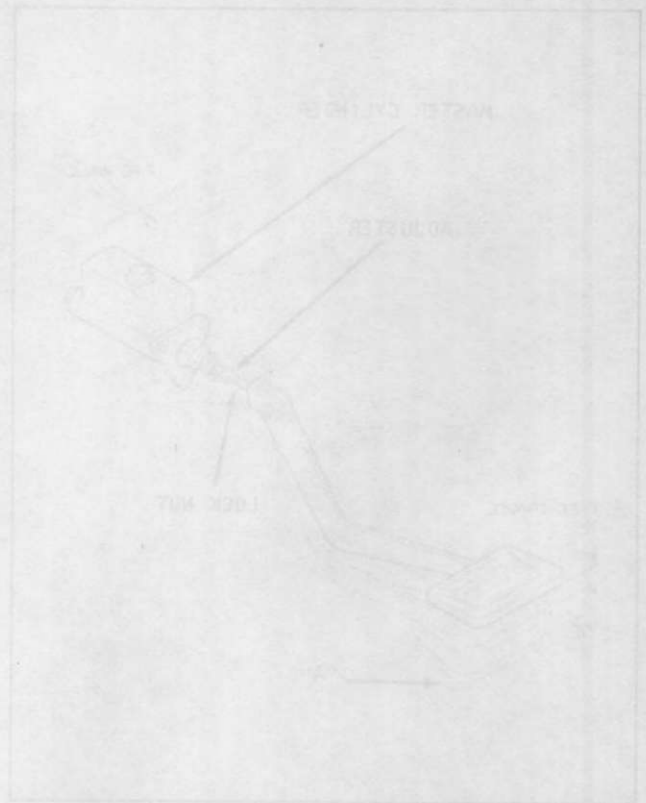


FIG. 1-10
Front Pedal Free Sway Lock and Adjustment

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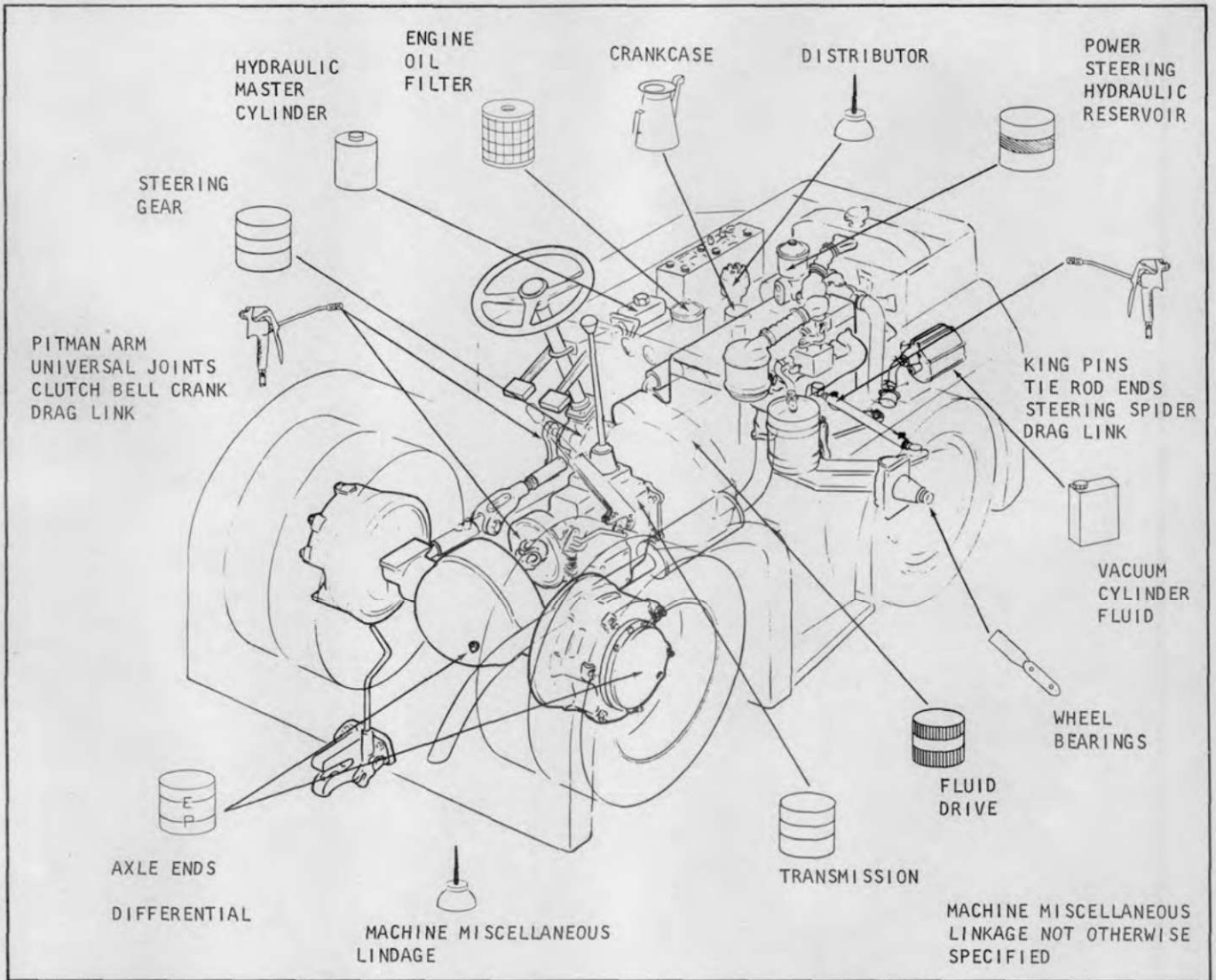
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LUBRICATION AND PREVENTIVE MAINTENANCE



WHEEL BEARING GREASE
SPEC. MS 9C



GEAR LUBE SAE 90



ENGINE OIL SAE 20



CHASSIS GREASE



VACUUM POWER CYLINDER LUBRICANT



ENGINE OIL: SAE 10W 0-32 deg. F
SAE 20W 32-75 deg. F
SAE 30W 75 deg. F +



Or use 10W-30 MULTI-GRADE OIL WITH MS ON CAN.

EXTREME PRESSURE
SAE 90 GEAR LUBE
PER CLARK SPECIFICATIONS MS-8 879803



AUTOMATIC TRANSMISSION FLUID
TYPE "A", SUFFIX "A". CLARK
PART NUMBER 879803



1800200 HYDRAULIC BRAKE FLUID
HEAVY DUTY SAE 70 R3



ENGINE OIL FILTER
CARTRIDGE KIT



HYDRAULIC OIL, CLARK
SPEC. MS 68 885385



STEERING SYSTEM ADJUSTMENTS

1. Support the front of the tractor in such a manner as to take the weight off the steering wheels.

W A R N I N G

PRIOR TO ANY ADJUSTMENT OF THE LINKAGE, PLACE BLOCKING UNDER MACHINE FRAME SO IT CANNOT BECOME LOWERED BY ACCIDENT. BLOCKING MUST BE OF ADEQUATE STRENGTH TO SUPPORT THE WEIGHT OF THE MACHINE.

2. Back off Pitman arm stops.

3. Set each steering wheel to axle stop for approximately 67 degrees wheel movement from a straight ahead position, make sure the two tie rod holes in the spider are positioned equidistant off center and parallel with centerline of truck, check steering wheels for being straight forward and parallel with each other. Adjust the tie rods if necessary to meet this condition.

4. At this point it is advisable to determine if the Pitman arm is assembled to the steering gear shaft in proper relationship to the steering gear worm. Do this by removing the Pitman arm from the steering gear shaft then count the number of turns the hand wheel makes from the extreme clock-wise position to the extreme counter-clockwise position. Now return the hand wheel to the mid-point. At this position of the hand wheel, with the steering wheels straight ahead, the Pitman arm should be assembled as near vertical down position as possible. Make adjustments in the control drag link to satisfy the above condition.

5. Now set the Pitman arm stops to limit the steering cylinder travel in both directions so that the axle stops do not contact by approximately 1/16". This will prevent the steering cylinder force from being "locked up" withing the steering linkage and causing excessive wear or possible damage.

7. COMPRESSION TEST

a. Test battery for full charge (specific gravity 1.280 temperature of 24°C (75°F)). If battery is not fully charged, replace with fully charged battery.

b. Start engine and allow it to warm up until normal operating temperature is reached.

c. Turn off ignition.

d. Remove spark plug cables from spark plugs and remove spark plugs from cylinder head. Examine spark plugs for carbon deposits, defective insulation and general serviceability. All carbon or lead deposits must be removed from the insulation shell and electrodes. This can be done on a sand blast cleaner. Carbon deposits should be removed from the plug threads with a stiff brush. After cleaning, inspect plugs carefully for cracked or broken insulator, badly pitted electrodes or other signs of failure.

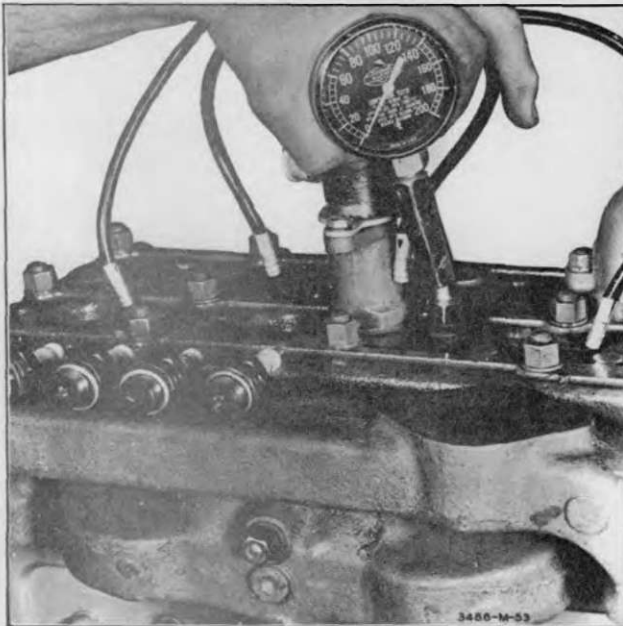


Plate 3486. Compression Test

e. With all plugs removed, install compression gauge in front spark plug port. Operate starting motor until maximum reading on gauge is obtained, see Plate 3486. Record gauge reading. Repeat this operation on each remaining cylinder.

f. If readings are reasonably high (110 to 120) pounds and the readings do not vary more than about 10 pounds between cylinders, compression may be considered normal. Excessively low readings or readings that vary more than 10 pounds between cylinders indicate internal trouble to be corrected after further examination and testing.

g. Set the spark plug gap as specified, by bending side electrode only. The gap should be checked with a wire feeler gauge rather than a flat type gauge as it is better suited for this purpose.

h. Spark Plug Specifications:

- Standard Type - .025" Gap
- Resistor Type - .035" Gap

i. Replace spark plugs using new gaskets. Always replace spark plug gasket whenever a spark plug is removed from the engine. Before installing plugs, be sure that the spark plug seat in the cylinder head is clean and free from obstructions. The spark plug should be screwed into cylinder head (using a socket of proper size) sufficiently tight to fully compress the gasket. This is most important as a large percentage of troubles due to overheated spark plugs are caused by plugs being too loose in the cylinder head. Conversely, excessive tightening may change the gap between the electrodes or crack the insulator.



Plate 3278. Check Spark Plug Gap

STARTING MOTOR

1. Remove end plate (or Brush Cover) from starter. Use a wire hook to lift a brush spring and remove brush from holder. Compare brush size with that of a new brush. If brush is worn beyond half the original size, or if brushes are jammed, chipped, or broken they must be replaced.

CAUTION

NEVER ALLOW SPRING TO SNAP DOWN ON BRUSHES.

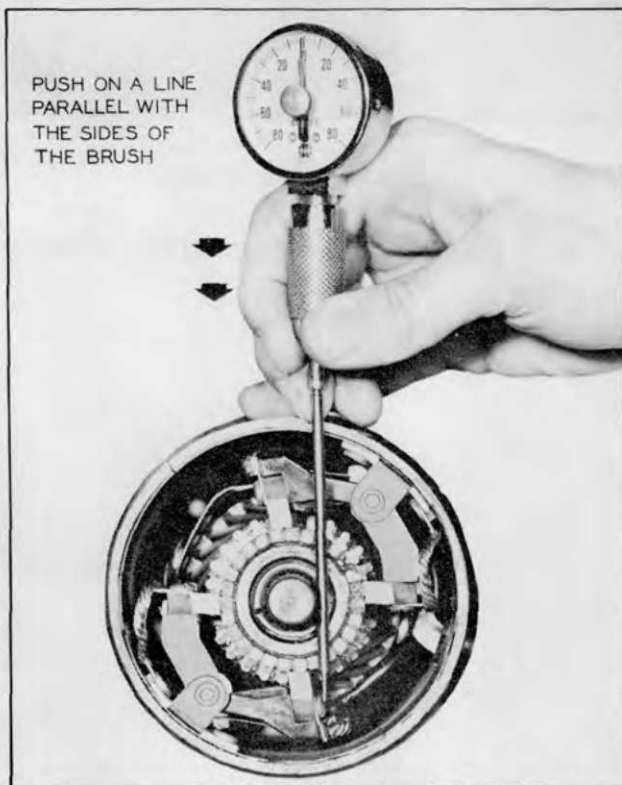


Plate 6449 Checking Brush Spring Tension

2. Check for Brush Spring Tension, refer to Specifications. Refer to the following procedures for checking spring tension.

Measuring Brush Spring Tension - Reaction Type Brushes. Hook the scale under the brush spring near the end and push or pull on a line parallel to the sides of the brush. To assist in telling the exact instant that the pressure is relieved, a small strip of paper can be placed under the brush. Pull slightly on the paper and the paper will slip out at the correct instant for reading the spring scale.

Measuring Spring Tension - Swinging Type Brushes: Hook the spring scale under the brush screw tight

against the brush and push or pull on a line parallel to the sides of the brush. Take the reading just as the brush leaves the commutator. Pulling slightly on a strip of paper which has been placed under the brush will indicate when the brush leaves the commutator and the correct instant for reading the spring scale.

3. If commutator is glazed or dirty, clean with a strip of No. 00 sandpaper. Blow out all dirt and grit with compressed air.

CAUTION

DO NOT USE EMERY CLOTH TO CLEAN COMMUTATOR.



Plate 6450. Checking Brush Spring Tension

Condition Test: Use one of the two following methods to determine whether the starting motor should be removed from the engine for inspection, service or replacement.

1. First Method: Operate the starting motor by disconnecting the battery cable from the solenoid switch and holding the cable terminal firmly against the starting motor terminal, using a battery known to be fully charged and in good condition. To do this it will be necessary to remove the solenoid switch.



Plate 7908. Vacuum Cylinder Fluid

NOTE

Only new, clean genuine hydraulic brake fluid should be used. Keep master cylinder filled with clean fluid during bleeding operation. A bleeder hose should be used. Install bleeder hose on first bleeding screw to be bled. Have loose end of bleeder hose submerged in brake fluid in glass jar. This prevents the possibility of air being sucked into lines during bleeding operation.

3. It is necessary to first bleed fluid at the Hydrovac Unit. Loosen Bleeder Screw #1 one full turn, depress brake pedal slowly allowing fluid and air to escape at this point. Tighten the bleeder screw and then release brake pedal. Repeat this operation several times providing a pumping action which will force out air at this point. Remove bleeder hose and install hose on Bleeder Screw #2.

4. Loosen Bleeder Screw #2 one full turn and depress brake pedal slowly allowing fluid and air to escape at this point. Tighten bleeder screw and allow brake pedal to return to its off position. Repeat this procedure several times providing a pumping action which will force out air at this point. Remove bleeder hose.

NOTE

This procedure must be repeated until air has escaped from the system at both these points. Always release brake pedal after closing bleeder screw, never before.

5. Install bleeder hose on the bleeder screw of the lower wheel cylinder on the left front wheel. Loosen bleeder screw and depress brake pedal slowly allowing fluid and air to escape, tighten bleeder screw and release brake pedal. Repeat procedure approximately ten times. After this line has been properly bled, repeat the same procedure on the upper wheel cylinder of the same wheel. Then bleed the lower right front wheel cylinder. Now bleed the upper right front wheel cylinder. The bleeding operation must be repeated until the system is properly bled, completely free of air.

NOTE

Fluid withdrawn from the system during bleeding operation should not be used again.

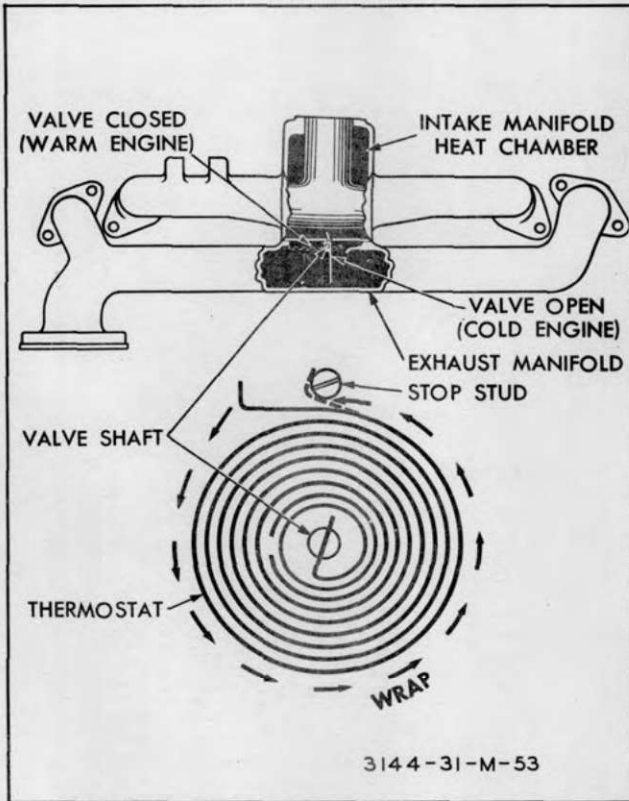


Plate 3144. Manifold Heat Control Valve

AUTOMATIC HEAT CONTROL VALVE

Exhaust from the combustion chamber passes through the exhaust valve ports into the exhaust manifold and out through the exhaust pipe. The manifold heat control valve permits faster warmup of the engine by diverting exhaust from the engine through a by-pass port and out through the exhaust manifold.

An automatic heat control valve is used on engines equipped with a universal type manifold. (The universal type manifold makes possible up-front or down-rear exhaust. In addition, updraft and downdraft carburetion is available.)

This valve regulates the amount of heat that by-passes around the inlet manifold heater body. An occasional check should be made to insure that the valve and shaft are free and not restricted in their operation. If the shaft is frozen or bushing is damaged, the assembly should be repaired or replaced.

The thermostat spring attached to the valve shaft in the manifold should be replaced when it becomes weak.

The manifold heat control valve counterweight employed with universal type manifolds can be positioned to meet manufacturers' specifications.

TROUBLE SHOOTING GUIDE

ENGINE (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY
Engine misses at high speeds. (continued)	<p>Valves sticking, weak or broken valve springs.</p> <p>Fuel strainer clogged.</p> <p>Weak distributor bracket arm spring</p> <p>Excessive play in distributor shaft bearing.</p> <p>Spark plugs defective, dirty or gap incorrectly set.</p>	<p>Report to designated individual in authority.</p> <p>Remove and clean strainer.</p> <p>Replace point set.</p> <p>Replace distributor.</p> <p>Clean, adjust or replace spark plugs.</p>
Engine pings (Spark Knock).	<p>Ignition timing early.</p> <p>Distributor automatic spark advance stuck in advance position, or spring broken.</p> <p>Excessive carbon deposit in cylinders.</p> <p>Incorrect fuel.</p>	<p>Reset timing.</p> <p>Replace distributor.</p> <p>Remove cylinder head and clean.</p> <p>Drain, use correct fuel.</p>
Engine lacks power.	<p>Ignition timing late.</p> <p>Incorrect fuel.</p> <p>Leaky cylinder head gasket.</p> <p>Excessive carbon formation.</p> <p>Engine runs cold.</p> <p>Insufficient oil, or improper grade oil.</p> <p>Oil system failure.</p> <p>Air Cleaner dirty.</p> <p>Spark plug gaps too wide.</p> <p>Choke valve partially closed, or throttle does not open fully.</p> <p>Manifold heat control inoperative.</p> <p>Exhaust pipe, muffler or tail pipe obstructed.</p> <p>Low compression, broken valve springs, sticking valves.</p>	<p>Reset timing.</p> <p>Use correct fuel.</p> <p>Replace gasket.</p> <p>Remove cylinder head, and clean cylinder head, piston heads, cylinder block, and valves.</p> <p>Test thermostat; in cold weather, cover radiator.</p> <p>Lubricate in accordance with lubrication section.</p> <p>Report to designated individual in authority.</p> <p>Clean complete air cleaner, change oil in cup. Reset gaps.</p> <p>Adjust valve or throttle.</p> <p>Free-up and adjust control.</p> <p>Service or replace obstructed parts.</p> <p>Report to designated individual in authority.</p>

IGNITION SYSTEM

TROUBLE	PROBABLE CAUSE	REMEDY
Ignition system troubles.	<p>Weak spark.</p> <p>Timing incorrect.</p> <p>Moisture on distributor wires, coil, or spark plugs.</p> <p>Ignition switch inoperative.</p> <p>Primary or secondary wiring loose, broken, or grounded.</p> <p>Coil defective.</p> <p>Distributor defective.</p> <p>Spark plug defective.</p>	<p>Refer to "Engine will not start".</p> <p>Retime ignition.</p> <p>Clean and dry thoroughly.</p> <p>Replace switch.</p> <p>Service.</p> <p>Refer to "Ignition coil troubles", below.</p> <p>Refer to "Distributor troubles", below.</p> <p>Refer to spark plug troubles below.</p>
Ignition coil.	<p>Connections loose; dirty or broken external wire, wet.</p> <p>Coil defective.</p>	<p>Clean and tighten, or repair, dry thoroughly.</p> <p>Replace coil.</p>
Distributor troubles.	<p>Distributor breaker points dirty or pitted, point gaps incorrect.</p> <p>Distributor breaker point arm spring weak.</p> <p>Distributor breaker points sticking.</p> <p>Distributor automatic advance defective.</p> <p>Distributor cap or rotor shorted, cracked or broken.</p> <p>Distributor rotor does not turn.</p> <p>Condenser defective.</p>	<p>Clean, adjust or replace breaker points.</p> <p>Replace breaker point arm.</p> <p>Free-up breaker points.</p> <p>Lubricate and free-up. If seized, replace distributor.</p> <p>Replace defective parts.</p> <p>Report to designated individual in authority.</p> <p>Replace condenser.</p>
Spark plug troubles.	<p>Cracked, broken, leaking, or improper type.</p> <p>Spark plug wires incorrectly installed on plugs or in distributor cap.</p> <p>Spark plugs dirty; gap incorrect.</p> <p>Spark plug porcelain cracked or broken.</p>	<p>Replace spark plug.</p> <p>Install wires correctly.</p> <p>Clean, set gaps, or replace plugs.</p> <p>Replace plug.</p>

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