DODGE
FARGO
DE SOTO

AUSTRALIAN TRUCK SHOP MANUAL

MODELS

1 — 08 AD	1 — 08 AF	1 — 08 AS
2 — 26 AD	2 — 22 AF	2 — 26 AS
2 — 33 AD	2 — 33 AF	2 — 33 AS
3 — 59 AD	3 — 59 AF	3 — 59 AS
6 — 71 AD	6 — 71 AF	6 — 71 AS
8 — 65 AD	8 — 65 AF	8 — 65 AS
8 — 71 AD	8 — 71 AF	8 — 71 AS
8 — 71 AD-D	8 — 71 AF-D	8 — 71 AS-D

CHRYSLER AUSTRALIA LIMITED — MAPLE AVENUE, KESWICK, SOUTH AUSTRALIA

A. S. M. — 100

Since the printing of the cover, additional models have been added to the vehicle range. Service information for all models as listed hereunder is contained in this manual.

1 — 08 AD	1 — 08 AF	1 — 08 AS
1 — 08 BD	1 — 08 BF	1 — 08 BS
2 — 26 AD	2 — 26 AF	2 — 26 AS
2 — 26 BD	2 — 26 BF	2 — 26 BS
2 — 33 AD	2 — 33 AF	2 — 33 AS
3 — 59 AD	3 — 59 AF	3 — 59 AS
6 — 71 AD	6 — 71 AF	6 — 71 AS
8 — 65 AD	8 — 65 AF	8 — 65 AS
8 — 71 AD	8 — 71 AF	8 — 71 AS
8 — 71 AD-D	8 — 71 AF-D	8 — 71 AS-D

Printed in Australia

AUSTRALIAN TRUCK SHOP MANUAL

FOREWORD

This sectional Shop Manual is prepared as both a guide and reference book in the complete servicing of Australian Dodge, Fargo and DeSoto Trucks.

All elementary information will be omitted except where variations from the conventional design occur and warrant some further explanations.

The repair subjects will be treated briefly but with sufficient detail to make the various operations clear.

Each section will also include the model specifications pertaining to the models covered in the text and will make reference to the special tools necessary for the performance of the repairs.

The complete manual will consist of the numbered subjects as indicated in the "Section Index".

The division of each section will provide the following steps whenever possible.

1. Removal and installation of unit.
2. Adjustments.
3. Maintenance.

Replacement Parts

MoPar Parts are specially engineered for every Chrysler-built vehicle and are strongly recommended for use in conjunction with this Manual.

Made to identical specifications, as the parts originally supplied with the vehicle you are servicing; MoPar parts are packaged for time-saving fitting, convenient handling and ready identification.

Each part carries the Chrysler Australia warranty for long and satisfying service.

CHRYSLER AUSTRALIA LIMITED
KESWICK, SOUTH AUSTRALIA

Printed, Published and Distributed by
SCIENTIFIC MAGAZINES PUBLISHING CO.
Rockdale — New South Wales
By arrangement and in association with
CHRYSLER AUSTRALIA LIMITED, Keswick — South Australia

THE PROPER CARE OF NEW ENGINES

The life of a truck depends on the care it receives for the first 500 to 1,500 miles of operation, and every owner should be thoroughly instructed in how to "break-in" the new engine when the new truck is delivered to him.

New (or reconditioned) engines should never be driven in excess of 35 miles per hour in direct drive for the first 500 miles of operation. During the next 2,000 miles of operation, the speed may be gradually increased to complete the breaking-in process. The truck must not be driven at continued high speeds for the first 2,500 miles. Be sure that the engine has been driven at least 4,000 miles before attempting to make it produce maximum power. This mileage is necessary to make sure that all internal engine friction has been minimized.

Gradually burnishing the engine bearing surfaces by careful "break-in" will create very hard and smoothly glazed surfaces. This type of surface is most desirable and has much to do with the length of the life of the parts before wear makes replacement necessary.

In new or reconditioned engines, the oil should be drained after the first 500 miles of operation and the oil pan refilled with an oil as recommended in the Lubrication Section of this shop manual.

ENGINE WARM-UP.

After the engine (when cold) is started, it is not good practice to accelerate unnecessarily during the warm-up period. Also, the truck should be driven slowly until the engine reaches normal operating temperature. These precautions will assure proper lubrication of vital bearing surfaces and will aid in promoting maximum engine efficiency.

SEASONAL PREPARATION

Seasonal preparation service should be performed in the Spring and Autumn of each year to prepare trucks for the approaching extreme temperature conditions, to avoid possible difficulties and to maintain maximum performances.

Complete procedure for engine tune-up will be found in the Engine Section of this shop manual. An engine should be given a Minor Tune-up often enough to maintain top performance, but it should not be necessary to give an engine a Major Tune-up or Performance Inspection more than twice a year to forestall an approaching decline of engine performance. The Minor Tune-up, Performance Inspection and Major Tune-up operations are recommended as good Seasonal Preparation (Spring and Autumn).

MOPAR anti-freeze should be used in the cooling system at the approach of freezing weather. After the cold season is past, drain the cooling system and discard the old anti-freeze. Then, put in MOPAR Rust Resistor with a fresh filling of water to protect the system against corrosion during the warm weather driving.

In the Lubrication Section of this shop manual, different viscosities of lubricants are indicated for different temperatures of different major units of the truck. While it is not imperative to make changes of lubricants at exact temperatures, it is good practice to make certain that lubricants are of low enough viscosity to permit proper lubrication and minimize cold lubricant resistance before the cold weather comes. This is especially true of engine oil. Thin oil has less drag on the moving parts and is distributed more quickly after starting. This decreases the bearing and piston wear by minimizing metal-to-metal contact.

In addition to Engine Tune-up, inspection of other parts of the truck at the time of Seasonal Preparation is good practice from the customer's viewpoint as well as the dealer's. It may indicate necessity for correction of wheel alignment, brake adjustment, replacement of brake lining or electrical equipment, or adjustment (or replacement of parts) of the steering mechanism. All such items have much to do with the safety of driving.

MOPAR PARTS PACKAGES ARE TIME-SAVERS AND ENSURE A SATISFACTORY REPAIR JOB

Chrysler Australia Limited has set up its own Parts Division, which markets specially engineered parts under the name of "**MoPar**".

One of the principal service facilities which **MoPar** offers to help your workshop and the Chrysler-built vehicle owner, is to merchandise packaged parts for your double protection. To protect your profits by saving service time, and to protect your reputation by the **MoPar** genuine parts warranty. Vehicle repair is facilitated by **MoPar** parts packages.

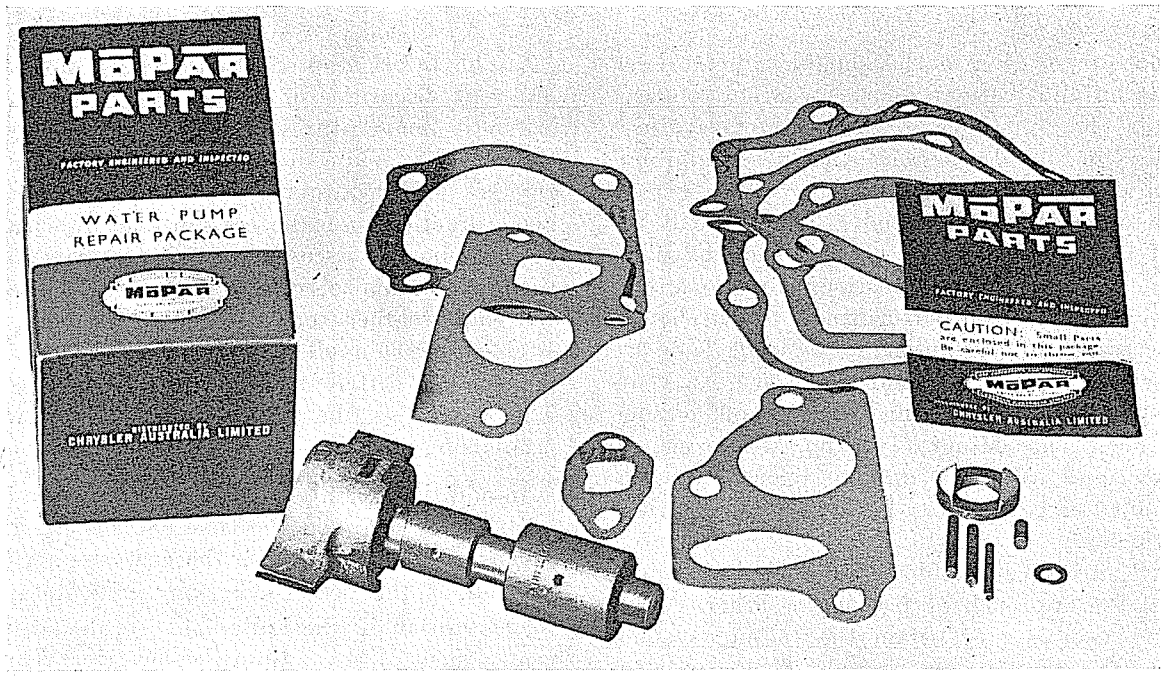
The parts are all engineered, manufactured and inspected according to the high standards of quality required in the building of new vehicles.

Only genuine **MoPar** parts can live up to these standards for the vehicle you are to service, whether it be a Chrysler, Dodge, DeSoto, Plymouth or Fargo, as it is only from the original vehicle manufacturer that the complete know-how of parts engineering can emanate.

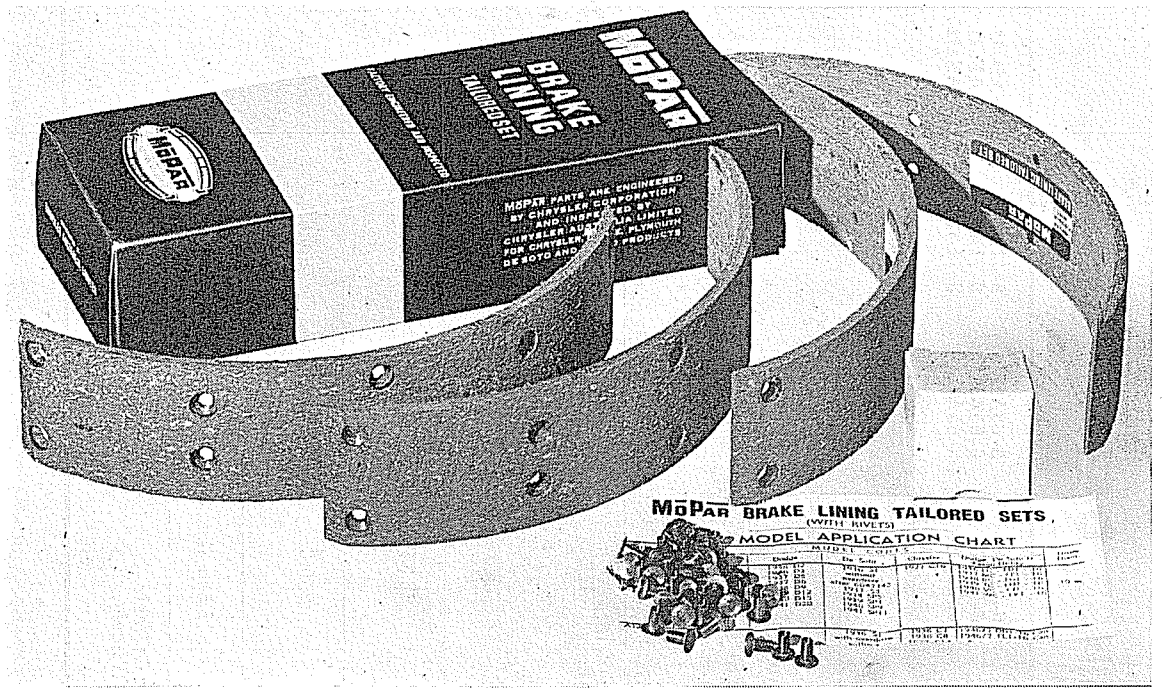
When you open the lid of a **MoPar** box you can be sure that the right parts for the job are there.

In making a repair, always make certain that you have all the correct material to carry out the necessary service. This condition will be assured if you obtain a factory standard **MoPar** parts package in advance of making the contemplated repairs.

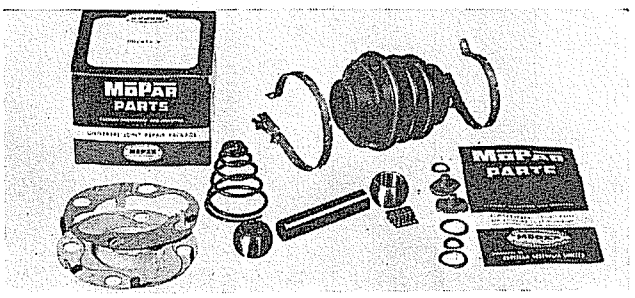
The accompanying photographs are typical of the service packages available, and your Parts Lists applying to the various models will provide a complete list of these handy parts packages.



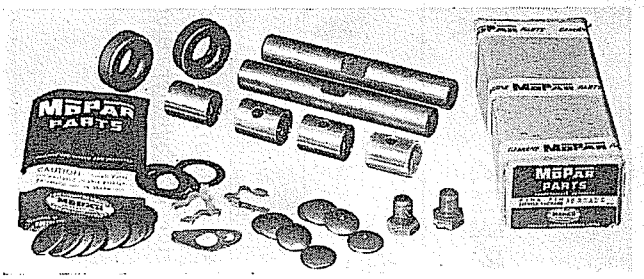
WATER PUMP REPAIR PACKAGE



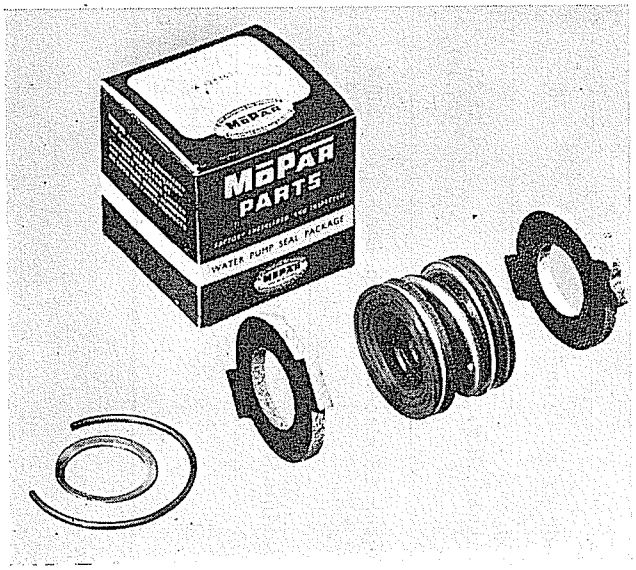
BRAKE LINING TAILORED SET



UNIVERSAL JOINT REPAIR PACKAGE



KING PIN SERVICE PACKAGE



WATER PUMP SEAL

WHEEL CYLINDER SERVICE PACKAGE

SERIAL NUMBERS AND LICENSE DATA

MODEL	1-08AD 1-08AF 1-08AS	2-26AD 2-26AF 2-26AS	2-33AD 2-33AF 2-33AS	3-59AD 3-59AF 3-59AS	6-71AD 6-71AF 6-71AS	8-65AD 8-65AF 8-65AS	8-71AD 8-71AF 8-71AS	8-71AD-D 8-71AF-D 8-71AS-D
STARTING SERIAL NUMBERS	1	1	1	1	1	1	1	1
Location of Serial Number located on Dash Panel. (All Models). Location of Engine Number stamped on boss L.H. side of Cylinder Block. (All Models).								
LICENSE DATA: Cylinder Bore	$3^{7}/_{16}$" * ($3\frac{3}{8}$")	$3^{7}/_{16}$" * ($3\frac{3}{8}$")	$3^{7}/_{16}$" * ($3\frac{3}{8}$")	$3^{7}/_{16}$"	$3^{7}/_{16}$"	$3^{7}/_{16}$"	$3^{7}/_{16}$"	$3\frac{1}{2}$"
Stroke	$4\frac{1}{2}$" * ($4^{1}/_{16}$")	$4\frac{1}{2}$" * ($4\frac{1}{4}$")	$4\frac{1}{2}$" * ($4\frac{1}{4}$")	$4\frac{1}{2}$"	$4\frac{1}{2}$"	$4\frac{1}{2}$"	$4\frac{1}{2}$"	5"
Number of Cylinders	6	6	6	6	6	6	6	6
Taxable H.P.	28.35 * (27.34)	28.35 * (27.34)	28.35 * (27.34)	28.35	28.35	28.35	28.35	29.4
Piston Displacement (cub. ins.)	250.6 * (218.06)	250.6 * (228.12)	250.6 * (228.12)	250.6	250.6	250.6	250.6	288.6
Maximum G.V.W. Rating	5,250 lbs.	‡ 7,500 lbs.	† 8,000 lbs.	12,320 lbs.	18,500 lbs.	21,000 lbs.	21,000 lbs.	21,000 lbs.

† 7,500 lbs. on vehicles fitted with Single Rear Wheels.
‡ 8,000 lbs. on vehicles fitted with Dual Rear Wheels.
* In effect on engine numbers prefixed "T".

SECTION 2

LUBRICATION

SERVICE BULLETIN REFERENCE

NUMBER	DATE	SUBJECT	CHANGES

NOTES

LUBRICANT, COOLING SYSTEM AND FUEL TANK CAPACITIES

Model	*Engine Refill Pints	Transmission			Rear Axle Differential			Cooling System Gallons	Fuel Tank Standard Gallons
		3 Speed Pints	4 Speed Pints	5 Speed Pints	Single-Speed Reduction Hypoid	Two Speed Axle Standard	Two Speed Axle Heavy Duty		
1-08AD	9	3	†4		3			4	15
1-08AF	9	3	†4		3			4	15
1-08AS	9	3	†4		3			4	15
2-26AD	9	3	†4		4½			4	15
2-26AF	9	3	†4		4½			4	15
2-26AS	9	3	†4		4½			4	15
2-33AD	9		4		4½			4	15
2-33AF	9		4		4½			4	15
2-33AS	9		4		4½			4	15
3-59AD	10		5		7½			4	15
3-59AF	10		5		7½			4	15
3-59AS	10		5		7½			4	15
6-71AD	10		5		8	‡12		4	15
6-71AF	10		5		8	‡12		4	15
6-71AS	10		5		8	‡12		4	15
8-65AD	10			9	8	‡12	‡16	4	15
8-65AF	10			9	8	‡12	‡16	4	15
8-65AS	10			9	8	‡12	‡16	4	15
8-71AD	10			9	8		‡16	4	15
8-71AF	10			9	8		‡16	4	15
8-71AS	10			9	8		‡16	4	15
8-71AD-D	21			9			16	3½	15
8-71AF-D	21			9			16	3½	15
8-71AS-D	21			9			16	3½	15

*Includes filter.
†Applicable where vehicle fitted with 4 speed transmission as special equipment.
‡Applicable where vehicle fitted with 2 speed axle as special equipment.

LUBRICATION

Proper lubrication of the truck is extremely important, because it promotes easier driving and ensures longer life of the moving parts of the vehicle.

Trucks are operated in all types of service, in extreme heat and cold, over every type of terrain, in stop and go traffic, and on long distance hauls. These conditions require specific lubricants, and an organised schedule of servicing to promote efficient and economical truck operation.

These conditions have also brought about the use of a variety of lubricants to adequately handle lubrication requirements.

SPECIAL ATTENTION.

Trucks operated principally on gravel or dusty roads may need lubrication attention more frequently than recommended in the manual, and should be serviced accordingly. In dusty areas, air cleaners should be cleaned more often than recommended herein.

1. ENGINE OIL LEVEL INDICATOR.

The "FULL" mark on the indicator (Figure 1) shows the proper level of oil in the oil pan after the engine has been standing a few hours. As soon as the engine starts running the level will drop somewhat, due to the filling of oil passages and filter. A quart of oil should be added when the level is just above the "ADD OIL" mark on the indicator. The oil level should never be allowed to drop below the "ADD OIL" mark.

2. CARBURETTOR AIR CLEANER.

A heavy duty oil bath air cleaner is provided to afford maximum protection against dirt, dust and abrasives entering the engine. Under normal conditions the air cleaner should be examined at each recommended engine oil change.

If the sump is found to contain a mixture of oil and dirt up to the lower offset in the reservoir, the air cleaner should be removed and thoroughly cleaned. Remove cover and filter element, rinse element clean in kerosene and drain. Remove air cleaner base, empty the dirty oil from the reservoir and clean out the sump. Instal the air cleaner base and refill to the indicated level with the following viscosity engine oil.

Above 32°F.	SAE 50
Below 32°F.	No. 20W

In dusty territories the air cleaner (including the Oil Filler Pipe Air Cleaner) should be cleaned frequently. Under extreme conditions once a day may be necessary.

3. ENGINE OIL RECOMMENDATIONS.

During the first 500 miles it is recommended that No. 10W engine oil be used. If it is necessary to add oil during the first 500 miles, follow the above recommendation. At 500 miles, the oil pan should be drained and refilled with engine oil of the proper viscosity, according to the anticipated atmospheric temperature. The crankcase should be drained (while the engine is warm) and refilled with No. 10W oil during winter and SAE20 during summer. At 1500 miles, oil should be changed. Under normal conditions, further oil changes should be made every 1500 to 2000 miles, according to the following recommendations; if the anticipated minimum atmospheric temperatures will be:

Not lower than 32°F.	SAE 30
As low as +10°F.	SAE 20W

The oil pan should be drained while the engine is at normal operating temperature. Oil will drain more completely when hot, and will, therefore, carry out more of the foreign matter with it. It is recommended that the sump be removed at least twice a year to clean the interior, also the oil screen.

ABNORMAL CONDITIONS.

Dusty conditions—driving over dusty roads or through dust-laden air introduces abrasive material into the engine. If the air cleaner is kept in good condition, this will decrease the amount of dust entering the engine. However, if the engine oil becomes contaminated with dust or dirt, the oil pan should be drained while the engine is warm and refilled with new oil of the correct grade, to prevent harmful engine wear. The frequency of draining depends upon the severity of dusty conditions, therefore no definite draining periods can be recommended.

WINTER DRIVING.

If the truck is driven for short distances of only a few miles at a time at low speeds, or is engaged in frequent stops such as door to door delivery type of service, moisture may condense in the oil pan and form a sludge which may freeze and clog the oil inlet screen. Under conditions of this kind the engine does not become sufficiently warm to expel the condensation through the crankcase ventilating system, and the engine oil should be changed approximately every 500 miles—under extreme conditions more frequent changes may be necessary.

As an alternative to this frequent change period, an occasional drive of 30 miles or more at higher speeds will do much towards expelling the condensation through the ventilating system.

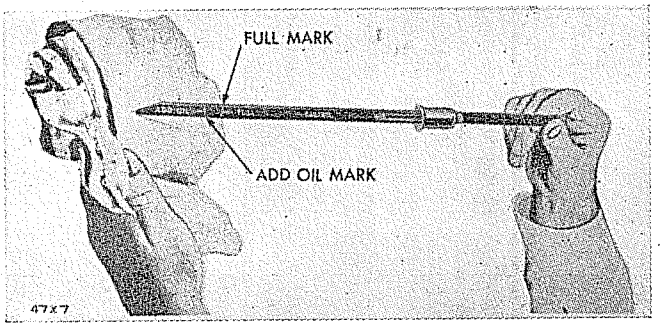
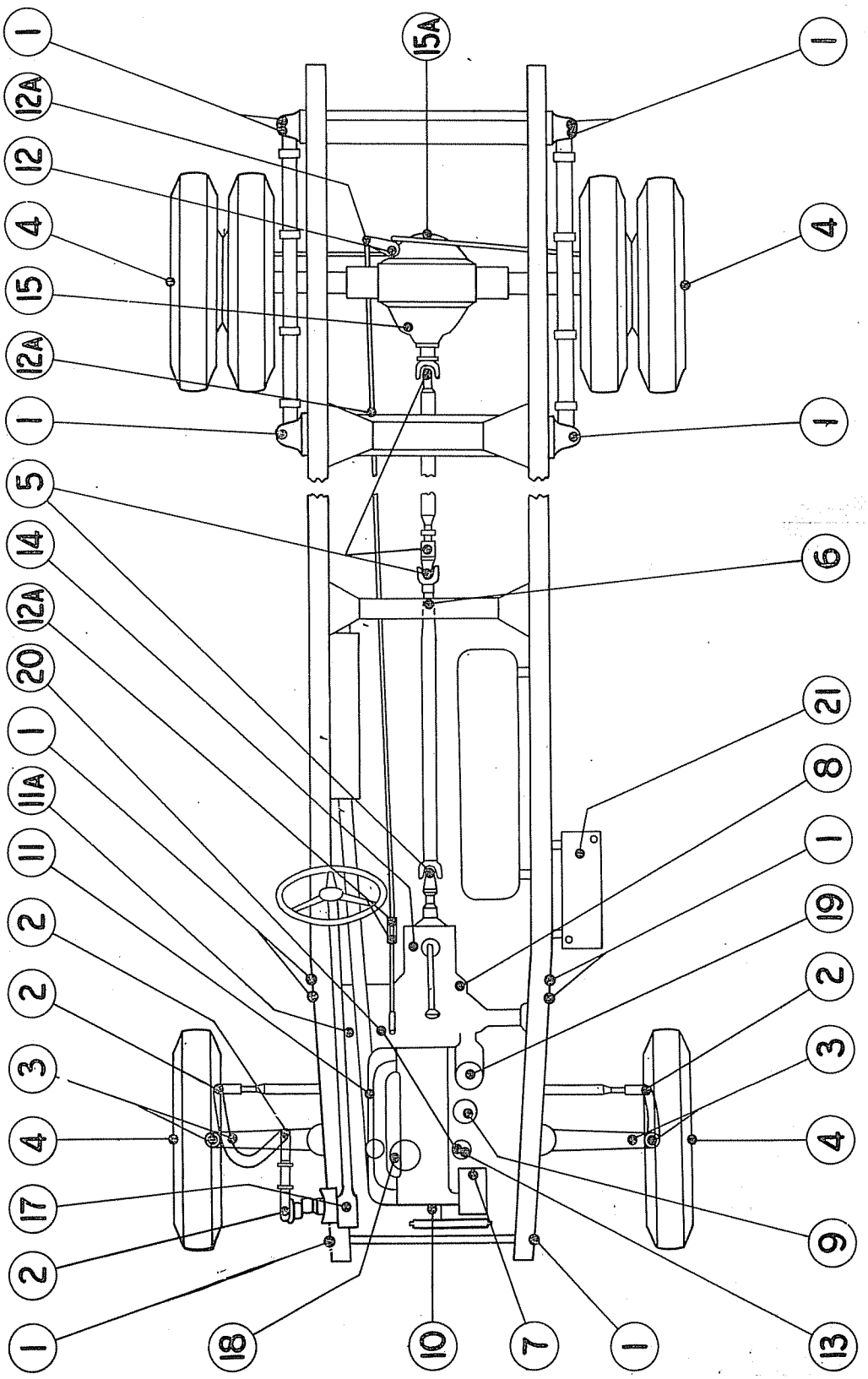


Fig. 1—Engine Oil Level Indicator.



LUBRICATION CHART.

The engine unit shown here refers to Petrol models only. Refer to the separate section of this manual for Lubrication Instructions for the Diesel Engine Unit.

LUBRICATION INSTRUCTIONS

Lubricate at each recommended Crankcase Oil Change Period

KEY NO.	MODELS	NAME OF UNIT	HOW LUBRICATED	TYPE OF LUBRICANT
18	All	Carburettor Air Cleaner	Remove and wash thoroughly in kerosene. Drain, allow to dry, and refill.	Engine Oil SAE 50.
	All	Air Cleaner—Oil Filler Pipe	Remove and wash thoroughly in kerosene, and re-oil.	SAE 50.

LUBRICATE EVERY 1,000 MILES

1	All	Front and Rear Spring Shackle and Pins	Grease Nipples	Chassis Lubricant.
2	All	Steering Track Rod and Drag Link Ball Joints	Grease Nipples	Chassis Lubricant.
3	All	King Pin Bushings	2 Fittings each side.	Chassis Lubricant.
6	3-59A, 6-71A 8-65A, 8-71A, 8-71A-D	Propellor Shaft Centre Bearing	1 Fitting.	Chassis Lubricant.
7	All	Generator	Wick.	5 Drops of Engine Oil.
8	All Except 8-71A-D	Clutch Release Cross Shaft	Soak Felt Wick.	Engine oil.
8	8-71A-D	Clutch Release Cross Shaft	2 Fittings.	Chassis Lubricant.
9	All Except 8-71A-D	Distributor	Felt Pad.	2 Drops of Engine Oil.
14	All	Transmission	Remove filler plug and check level, if necessary add lubricant to maintain level to bottom of filler plug hole.	SAE 90 Gear Oil
15	All	Rear Axle	Check oil level, if necessary add oil to maintain level at bottom of filler plug hole.	See under "Lubricate every 10,000 miles."

LUBRICATE EVERY 1,500 MILES

4	3-59A, 6-71A, 8-65A, 8-71A, 8-71A-D	Front Hub Bearings	1 Fitting to each hub adjacent to hub cap.	Chassis Lubricant.
4	3-59A and two speed axles	Rear Hub Bearings	1 Fitting to each hub located on axle shaft flange.	Chassis Lubricant.
		Note: Rear Hub Bearings on Hypoid Axles are Automatically Lubricated		
5	All	Propellor Shaft Sliding Joint	One Fitting.	Chassis Lubricant.
10	All	Water Pump	Two Fittings.	Special Water Pump Grease.
5	All	Propeller Shaft Universal Joints	One Fitting to each joint.	Gear Oil SAE 140.

LUBRICATE EVERY 2,000 MILES

KEY NO.	MODELS	NAME OF UNIT	HOW LUBRICATED	TYPE OF LUBRICANT
11	All	Throttle Controls	Oil can.	One or two drops of Engine Oil.
11A	All	Brake Pedal Pivot	One Fitting.	Chassis Lubricant.
11A	All	Brake Pedal Linkage	Oil can.	One or two drops of Engine Oil.
12	3-59A, 6-71A, 8-65A, 8-71A, 8-71A-D	Hand Brake Compensator	One Fitting.	Chassis Lubricant.
12A	All	Hand Brake Linkage	Oil can.	Few drops of Engine Oil.
17	All	Steering Gear	Check level through filler plug hole. Replenish if necessary.	SAE 90 Gear Oil.
13	All	Engine	Filler tube, drain and refill.	See Paragraph 3 of this section.

LUBRICATE EVERY 10,000 MILES

15	3-59A	Rear Axle (Spiral Bevel)	Filler and level plug drain, flush, refill.	SAE 140 E.P.
15A	1-08A, 2-26A, 2-33A, 6-71A, 8-65A, 8-71A	Rear Axle (Hypoid)	Filler and level plug drain, flush and refill.	SAE 90 E.P.
15	8-71A-D and models fitted with two-speed axle as special equipment	Rear Axle Two Speed	Filler and level plug drain, flush and refill.	SAE 90 E.P.
17	All	Steering Gear	Filler and level plug drain, flush with light flushing oil, refill to bottom of filler hole.	SAE 90 Gear Oil.
14	All	Transmission	Filler and drain plugs. Drain, flush with light flushing oil, refill to bottom of filler plug.	SAE 90 Gear Oil

LUBRICATE EVERY 15,000 MILES

4	1-08A, 2-26A, 2-33A	Front Wheel Bearings	Remove hub, clean bearings, and repack with short fibre wheel bearing grease.	Short fibre wheel bearing grease.
4	1-08A	Rear Wheel Bearings	Remove plugs, temporarily instal lubricant gun fittings. Lubricate with short fibre grease, then remove lubricant fittings and instal plugs. CAUTION: Do not inject more than ½ ounce of lubricant into each bearing	Short fibre wheel bearing grease.

KEY NO.	MODELS	NAME OF UNIT	HOW LUBRICATED	TYPE OF LUBRICANT
4	2-26A, 2-33A	Rear Wheel Bearings	Remove hub and bearings, clean and repack with short fibre wheel bearing grease. If on examination grease is found to be in good condition, do not remove it, but add new grease if necessary.	Short fibre wheel bearing grease.
19	All	Oil Filter or Filter Cartridge	Replace. See authorised Distributor or Dealer for MoPar replacement.	Replace cartridge every 10,000 miles **under normal conditions** and also at the time of an oil change.

CAUTION: After replacing filter or filter cartridge, operate the engine for about five minutes and check for oil leaks. The oil level in the sump should then be corrected to compensate for the oil absorbed by the new filter.

SECTION 3
AXLE, FRONT

SERVICE BULLETIN REFERENCE

NUMBER	DATE	SUBJECT	CHANGES

NOTES

FRONT AXLE

SERVICE STANDARD

MODEL ▷	1-08AD 1-08AF 1-08AS	2-26AD 2-26AF 2-26AS	2-33AD 2-33AF 2-33AS	3-59AD 3-59AF 3-59AS	6-71AD 6-71AF 6-71AS	8-65AD 8-65AF 8-65AS	8-71AD 8-71AF 8-71AS	8-71AD-D 8-71AF-D 8-71AS-D
Type	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott	Reverse Elliott
Camber	1½°	1½°	1½°	1½°	1½°	1½°	1½°	1½°
Caster (Unloaded)	3°-10′	1½°	1½°	1½°	1½°	1½°	1½°	1½°
Toe in at Hub Height	⅛″	⅛″	⅛″	⅛″ —0 +1/16	⅛″ —0 +1/16	⅛″ —0 +1/16	⅛″ —0 +1/16	⅛″ —0 +1/16
King Pin Inclination	4°	4°	4°	6°	6°	6°	6°	6°

TIGHTENING REFERENCE

PART NAME	TORQUE (FOOT POUNDS)
Spring Clip Bolt Nuts	62 to 69

AXLE, FRONT

REMOVAL, INSTALLATION AND MAINTENANCE.

ALL MODELS

1. REMOVAL AND INSTALLATION OF HUB, DRUM AND BEARINGS.

(1) Raise the front end of the truck with a jack until the wheel clears the floor or ground and remove the hub cap with suitable tool.

(2) Remove the cotter pin, front wheel bearing adjustment nut and thrust washer.

(3) Remove the outer bearing cone and rollers and pull the wheel, hub and brake drum off the steering knuckle.

(4) Remove the hub dust seal and inspect seal for wear and possible damage.

(5) Remove inner bearing cone and rollers.

(6) Remove inner and outer bearing cups with a a suitable puller or drive them out with a drift.

Inspect seal for damage, replace if necessary. The plain side of the seal is fitted toward the steering knuckle flange, that is toward centre line of vehicle.

Before assembling the bearings in the front wheel hub, make sure all the old lubricant is removed and the various parts are clean and in good condition. Then install the inner and outer bearing cups, driving them into place with a drift. Make sure the cups are correctly installed with the thick edge toward the centre of the wheel hub and that they are tight against their seat. Next, coat the inner bearing cone and rollers with Short Fibre Wheel Bearing Grease and assemble in the inner cup. Then install the dust seal and place some wheel bearing lubricant in the hub between the bearing cones (do not fill the space).

See Lubrication Section for correct amount of lubricant to use.

Before installing the wheel and hub, inspect the surface of the steering knuckle (where it contacts the hub dust seal) to make certain it is smooth. Roughness of this surface will cause rapid wear of the seal and result in grease leakage. Use care when sliding the hub on to the steering knuckle. Keep it straight with the knuckle so that the seal will not be damaged.

With the wheel and hub in position, coat the outer bearing cone and rollers with Short Fibre Wheel Bearing Grease and install them in the hub. Next, install the bearing thrust washer and bearing adjustment nut. Adjust the hub bearings as outlined in paragraph 2. Then, install cotter pin and hub cap filled with wheel bearing grease.

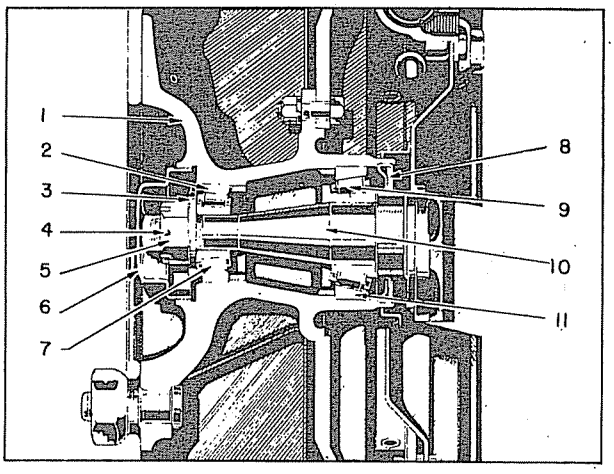


Fig. 1—Sectional View of Typical Front wheel Assembly. (1-08A, 2-26A, 2-33A).

1 — Hub
2 — Outer Bearing Cup
3 — Bearing Thrust Washer
4 — Bearing Nut Cotter Pin
5 — Bearing Nut
6 — Front Wheel Hub Cap
7 — Outer Bearing Cone and Rollers
8 — Hub Dust Seal
9 — Inner Bearing Cone and Rollers
10 — Steering Knuckle
11 — Inner Bearing Cup

2. ADJUSTING FRONT WHEEL HUB BEARINGS.

(1) Remove the hub cap. Remove the cotter pin from the bearing adjustment nut. Take up adjusting nut, revolving wheel until it binds slightly. Then, back off the adjusting nut so that the nearest slot indexes with the cotter

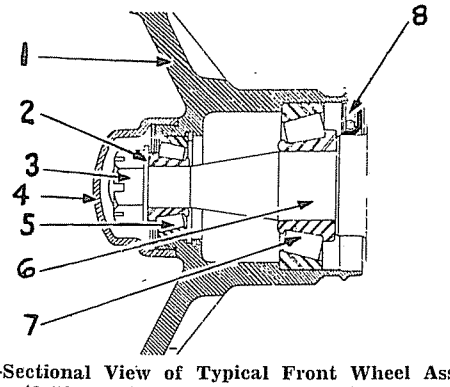


Fig. 2—Sectional View of Typical Front Wheel Assembly. (3-59A, 6-71A, 8-65A, 8-71A, 8-71A-D).

1 — Wheel Hub
2 — Thrust Washer
3 — Adjusting Nut
4 — Hub Cap
5 — Outer Bearing
6 — Steering Knuckle
7 — Inner Bearing
8 — Seal

pin hole in the spindle. Then lock nut. Never back off the adjusting nut less than one-half the distance from one slot to the next slot.

Wheel must rotate freely.

CAUTION

Do not mistake possible play in the king pin bushings for looseness in the wheel bearings. There should be no looseness in the wheel bearings. This is sometimes difficult to detect when adjusting front wheel bearings because of the weight of the wheel.

(2) After locking the nut with cotter pin, check adjustment by shaking wheel on the bearings and rolling the wheel to make certain that there is no more than a slight drag.

(3) Instal hub cap.

3. REMOVAL AND INSTALLATION OF DRAG LINK AND TIE ROD. MODELS 1-08A, 2-26A and 2-33A.

NOTE: On models 1-08A, 2-26A and 2-33A fitted with fore and aft steering, as shown in Figure 3, refer to paragraph 4 for removal and installation instructions.

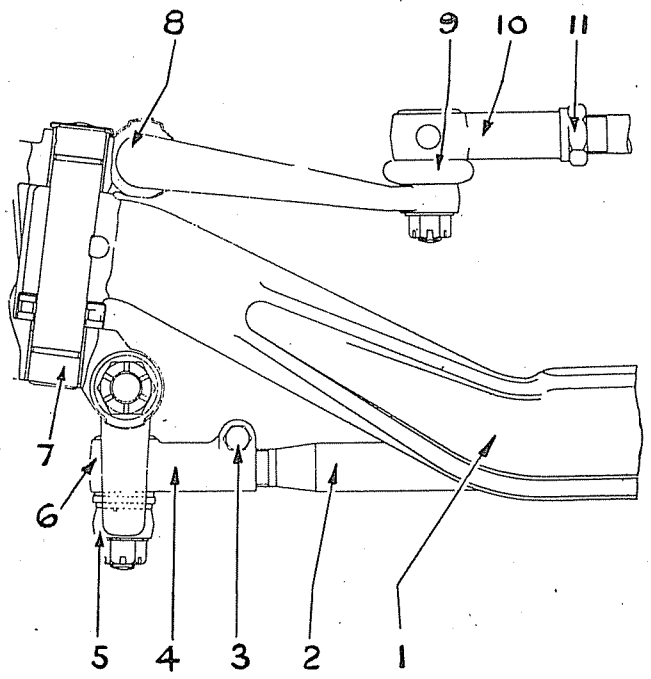


Fig. 3—Assembly of Tie Rod and Drag Link. (3-59A, 6-71A, 8-65A, 8-71A, 8-71A-D).

1 — I Beam
2 — Tie Rod.
3 — Tie Rod End Clamp Bolt
4 — Tie Rod Adjustable End.
5 — Steering Arm
6 — Tie Rod Ball End
7 — King Pin
8 — Steering Knuckle Arm
9 — Drag Link Oil Seal
10 — Drag Link Adjustable End
11 — Drag Link End Lock Nut

The drag link runs parallel to the front axle and is attached to the steering arm. It can be removed by removing the retainer nut and pushing the tie rod end out of the steering knuckle arm.

The drag link is attached to the rear of the steering arm.

When assembling the drag link, insert the drag link end stud through the steering arm from the top. Tie rods are assembled from the bottom.

4. REMOVAL — INSTALLATION OF DRAG LINK AND TIE ROD.

Models 3-59A, 6-71A, 8-65A, 8-71A, 8-71A-D.

(1) The tie rod and drag link ball joints are not adjustable, and if excessive wear takes place, the complete ball joint assembly will have to be replaced. (Figure 3).

(2) On the tie rod, the ball end is fitted in the tie rod lever (5) on a taper and secured by a nut and cotter pin.

(3) To disassemble, remove the cotter pin and nut and give the end of the ball pin a sharp tap with a hammer to free it from the taper.

(4) Loosen the clamp bolt (3) and the tie rod adjustable end (4) and unscrew from the tie rod (2).

(5) When fitting new parts make certain the ball end fits correctly in the tie rod lever taper.

(6) Retrack the front wheels (Refer Service Standards) and tighten securely the ball pin and clamp bolt nuts.

(7) The drag link ball ends are fitted at one end to the steering knuckle arm (8) and at the other to the steering Pittman or drop arm, both ball pins being fitted on tapers and secured by nuts and cotter pins.

(8) To remove an adjustable drag link end, firstly slacken the lock nut (11).

CAUTION: One lock nut has a right hand thread, the other a left hand thread.

(9) Remove the ball pin in a similar manner as the tie rod ball end (Item 3).

(10) Unscrew the ball end from the tie rod (right and left hand threads) and after fitting new adjustable end, adjust the drag link end so that a full right and left hand lock is obtained, then securely tighten the ball pin nuts and cotter pins.

5. REMOVAL AND INSTALLATION OF STEERING KNUCKLE AND BUSHINGS (WHEEL AND HUB REMOVED).

Models: 1-08A, 2-26A, 2-33A.

(1) Block brake pedal so it cannot be depressed.
(2) Remove the cap screws which fasten the brake support to the steering knuckle, the brake shoe anchor bolt nuts must also be removed.
(3) Lift the complete brake support and brake shoe assembly off the steering knuckle without disconnecting the brake hose.

CAUTION: Brake shoes must not be allowed to spread or open up. Do not allow the brake support and shoe assembly to be supported by the flexible hose.

(4) Remove the king pin locking screw or pin.

(5) Remove king pin oil seal plug (steel disc) by driving a punch down into it and prying the seal up and out of the steering knuckle.

(6) Remove king pin, using tool DD.1155.

(7) Remove king pin bushings. See Figure 5.

When assembling, new king pin oil seal (steel disc) should be staked in place as shown in Figure 4.

The bushings should be installed from the top and bottom of the steering knuckle. (The oil hole in each bushing should line up with the oil hole in the steering knuckle (Figure 6).

The bushings should be line-reamed with a suitable reamer. The king pins should be a free slip fit in the bushings.

5A. REMOVAL AND INSTALLATION OF STEERING KNUCKLE AND BUSHING (WHEEL AND HUB REMOVED).

MODELS 3-59A, 6-71A, 8-65A, 8-71A and 8-71A-D.

(1) Block brake pedal so it cannot be depressed.

(2) Remove the bolts which fasten the brake support to the steering knuckle.

(3) Lift the brake support or backing plate clear of steering knuckle, care being taken not to stretch or damage the flexible brake hose. Hang the backing plate on to the chassis by means of wire or cord making sure that all weight is taken off the flexible hose.

(4) Remove king pin locking pin.

(5) Remove king pin oil seal by unscrewing grease nipple.

(6) Remove king pin, using tool DD-1155 and thrust bearing. Examine thrust bearing for wear, and replace if necessary.

(7) Remove king pin bushings, see Figure 5.

The bushing should be installed from the top and bottom. Dimension "A", Figure 6 is $\frac{1}{32}$ in. and the bushings protrude approximately $\frac{5}{32}$ in. Lubrication is effected through the grease nipples which are assembled to the oil seal and screwed into the top and bottom of the king pin.

The bushings should be line reamed with a suitable reamer. The king pin should be a free slip fit in the bushings.

When assembling the king pin, the short end above the king pin recess is to the top.

6. SERVICING THE AXLE I-BEAM.

The replacement of the axle I-beam is considered a major operation and can be performed in various ways, depending upon the model of the truck on which the work is being done, or upon the number of axle components to be replaced.

The operation described herein is a suggested removal method:

(1) Remove the front wheels, hubs and tie rod.

(2) Disconnect brake hoses and remove steering knuckles.

(3) Remove nuts from spring clips which hold the chassis springs to the axle centre, disconnect shock absorber (if so equipped) and remove axle.

7. FRONT WHEEL ALIGNMENT.

All the factors of front wheel alignment are interrelated; but each angle has a specific purpose. Four different angles are used in positioning the front wheels for easiest steering under varying conditions of weight and speed.

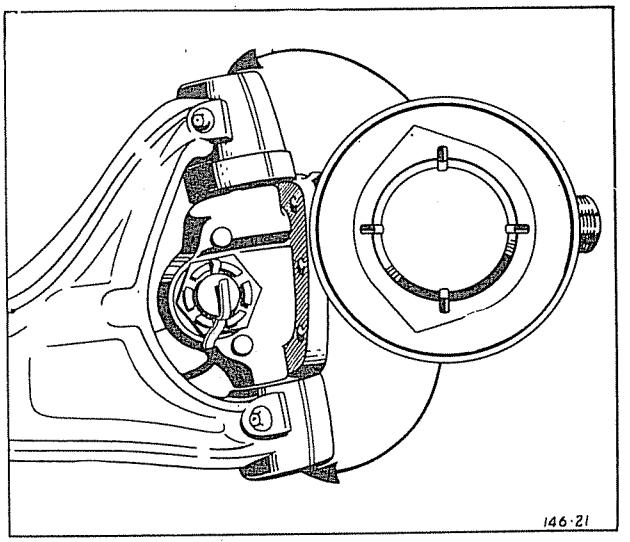


Fig. 4—Staking Lubricant Seal Plugs.

Should one of the four angles get out of position, the harmonious relationship of all of them is destroyed. Each angle depends upon the proper setting of the others, if the front wheels are to lead properly.

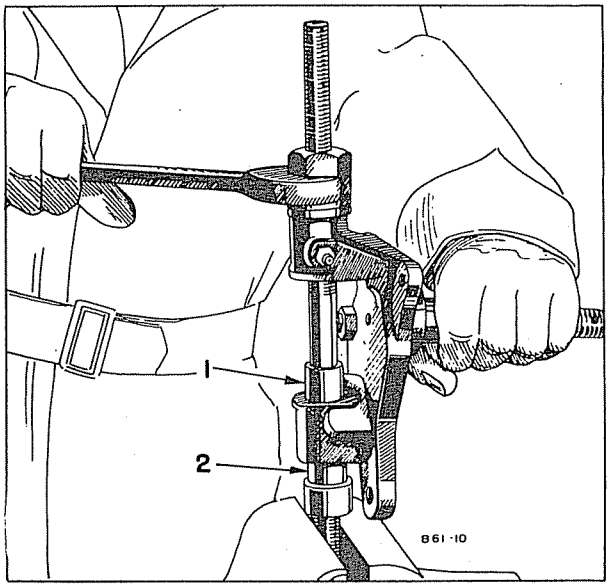


Fig. 5—Removing King Pin Bushing (Reverse Elliott Type Axle).
1 — King pin bushing.
2 — Tool C-328-A

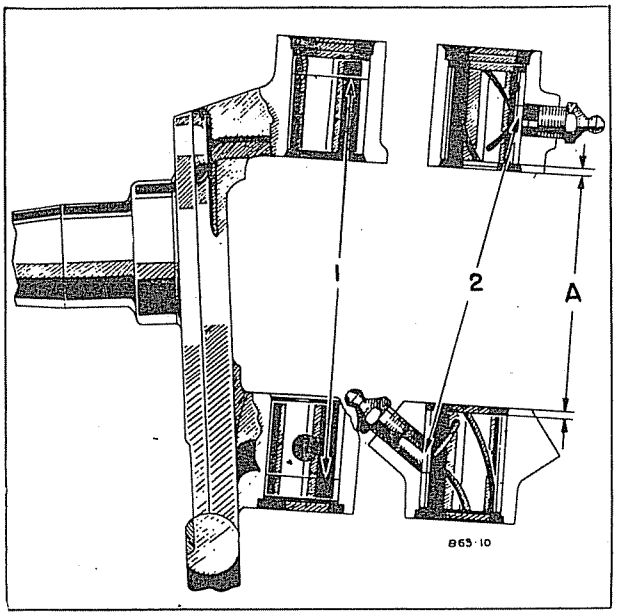


Fig. 6—King Pin Bushings Installed (Reverse Elliott Type Axle). 1-08A, 2-26A, 2-33A.
1 — Identification lines
2 — Lubricant holes
A — 1/16 in.

In making corrections to front wheel alignment, or installing new front axle parts, all four angles in both front wheels should be checked in the following order:

(1) King pin inclination.

(2) Camber.

(3) Caster.

(4) Toe-in and toe-out.

The instructions in this manual for checking front wheel alignment are based on the use of DD-428 Gauge and DD-435 Turntables. There are many other types of checking equipment in use that accomplish the same purpose, although the method of using the equipment may differ from the instructions in this manual. Regardless of the make or type of equipment used, however, the checking and adjusting should be done in the proper sequence as outlined herein.

Before checking the alignment of the front wheels, the following operations should be performed in the order listed. A successful alignment job cannot be accomplished unless these inspection operations are performed. Should inspection reveal the necessity for removing, installing or adjusting any part of the front axle or steering, prior to aligning the front wheels, complete instructions will be found in the respective sections of this manual.

(1) Inflate all tyres to recommended pressure.

(2) Check condition of tyres (blow-out patches, thin treads, vulcanizing, etc.). Changing the direction of tyre rotation is recommended. See wheels and Tyres Section in this manual.

(3) Check wheel and tyre run-out (wobble) and eccentricity.

(4) Check brakes for dragging.

(5) Check wheels for proper balance.

(6) Check front wheel bearing adjustment.

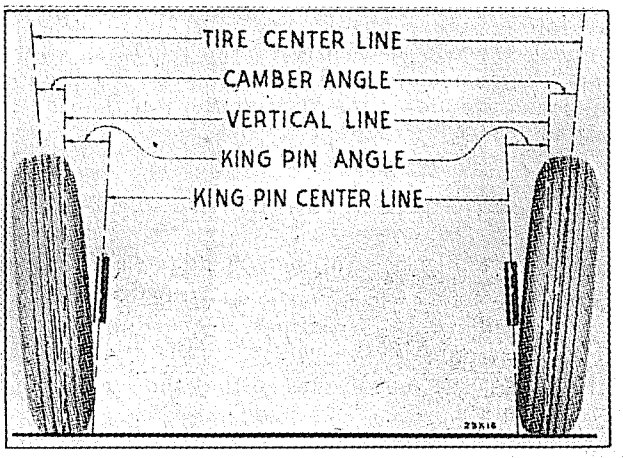


Fig. 7—Camber Angle and King Pin Angle (Inclination).

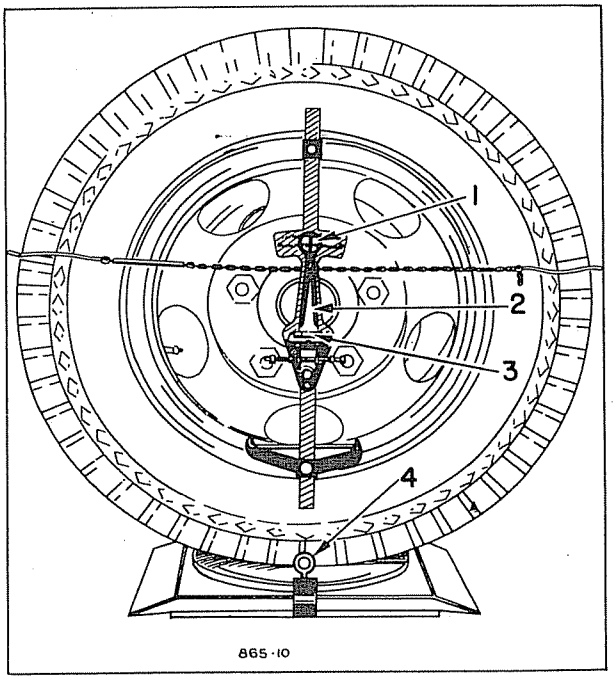


Fig. 8—Gauge Installed on Right Front Wheel.

1 — Hair line on zero
2 — Pointer or scratch mark
3 — Bubble level
4 — Turntable lock pin

(7) Check king pin bushing clearance.

(8) Check front springs.

(9) Check rear springs and U-bolts.

(10) Check steering connections for lost motion.

(11) Check steering gear adjustments.

(12) Check shock absorber control, if truck is so equipped.

When checking front wheel alignment, the truck should be placed on a level floor.

8. KING PIN INCLINATION.

King pin inclination is the amount in degrees that the top of the king pin inclines away from the vertical, toward the centre of the truck, as viewed from the front of the truck (Figure 7). Inclined king pins are closer together at the top than at the bottom.

9. CHECKING KING PIN INCLINATION.

(1) Inflate all tyres to recommended pressure.

(2) Place front wheels on locked turntables in the straight ahead position. Be certain that the wheels are in the centre of the turntables.

Note: Set the foot brakes so that the front wheels cannot rotate.

(3) Assemble gauge, as shown in Figure 8, so that quadrant is parallel with the wheel.

(4) Attach the gauge to the right wheel (using chain) in a vertical position so the bubble is level, hair line on zero and pointer on scratch mark.

(5) Remove turntable lock pins and turn wheels to the left 20 degrees as indicated on turntable scale. Adjust secondary screw (this controls short pointer) until bubble levels (Figure 9).

Note: Turn wheels past 20 degrees and back to relieve any bind that might occur. Brakes must be set constantly during this entire operation.

(6) Turn the wheels to the right until the right wheel has been turned 20 degrees past the straight-ahead position. Adjust the primary screw which controls the hair line, until the bubble levels. The reading on the 40 degree scale will be the king pin angle (Figure 9).

(7) To check the left wheel, follow the same procedure. However, the wheel should be turned to the right 20 degrees at start of operation.

When the king pin inclination is incorrect, it is an indication of a bent axle centre. Correction should be made by replacing damaged parts.

10. CAMBER.

Camber is the amount in degrees that the wheel inclines away from the vertical at the top, as viewed from the front of the truck. (Figure 7).

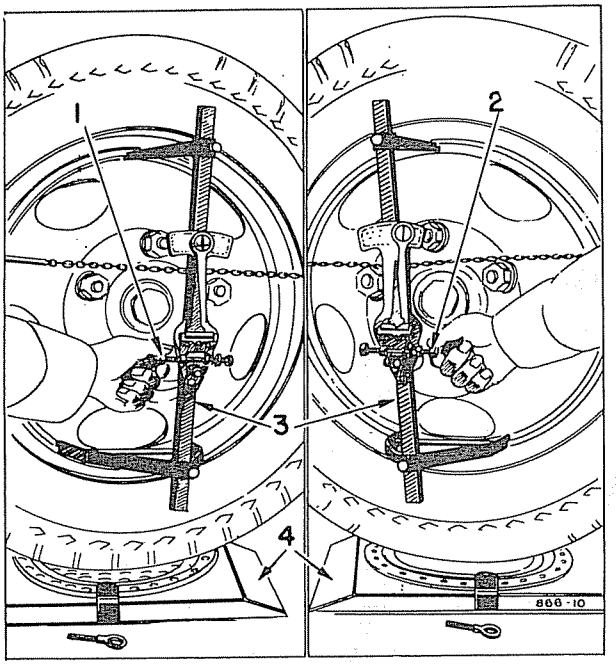


Fig. 9—Checking King Pin Inclination

1 — Secondary screw
2 — Primary screw
3 — Gauge (Tool DD-428)
4 — Turntables (Tool DD-435)

Wheels with positive camber are farther apart at the top than at the bottom. Wheels with negative camber are farther apart at the bottom than at the top.

The amount of camber used depends on the amount in degrees the king pin is inclined. An incorrect camber angle causes a scuffing action between the tyre and the road, resulting in abnormal tyre wear. Unequal camber in the front wheels may cause the truck to lead to the right or left.

11. CHECKING CAMBER.

Camber should be checked after the king pin inclination has been checked. If the king pin inclination is incorrect, it should be corrected before attempting to check camber.

(1) Place the wheels in the straight ahead position, with the weight of the truck on the wheels and the front end of the truck level.

(2) Assemble gauge so that the quadrant is at right angles to the wheel, as shown in Figure 10).

(3) Adjust the secondary screw so that the pointer lines up with the scratch mark.

(4) Adjust the primary screw so that the spirit level bubble is centred.

(5) Take the camber reading in degrees on the scale. Always use the 60 degree section of the quadrant for checking camber. If the wheel is not true, turn it 180 degrees and take another reading. Average the two readings to obtain correct camber angle.

(6) Readings from zero towards the wheel indicate positive camber. Readings away from the wheel indicate negative camber.

(7) Check the camber of the opposite wheel in the same manner.

No adjustment is provided for camber. If it is not within the foregoing limits, the axle centre or steering knuckle is bent and should be replaced.

12. CASTER.

Caster is the amount in degrees the top of the king pin is inclined toward the front or rear of the truck, as viewed from the side of the truck (Figure 11).

Positive caster is the tilting of the top of the king pin toward the rear of the truck, while negative or reverse caster is the tilting of the top of the king pin toward the front of the truck.

Positive caster imparts a trailing action to the front wheels, while negative or reverse causes a leading action. The correct amount of caster helps to keep the front wheels in the straight-ahead position. When turning a curve, caster acts as a lever, assisting the driver in returning the wheels to the straight-ahead position.

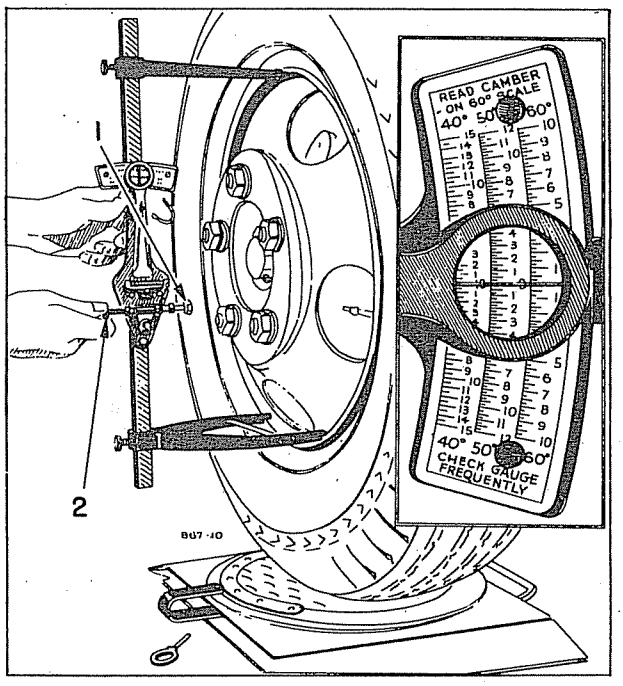


Fig. 10—Checking Camber.
1 — Primary screw 2 — Secondary screw

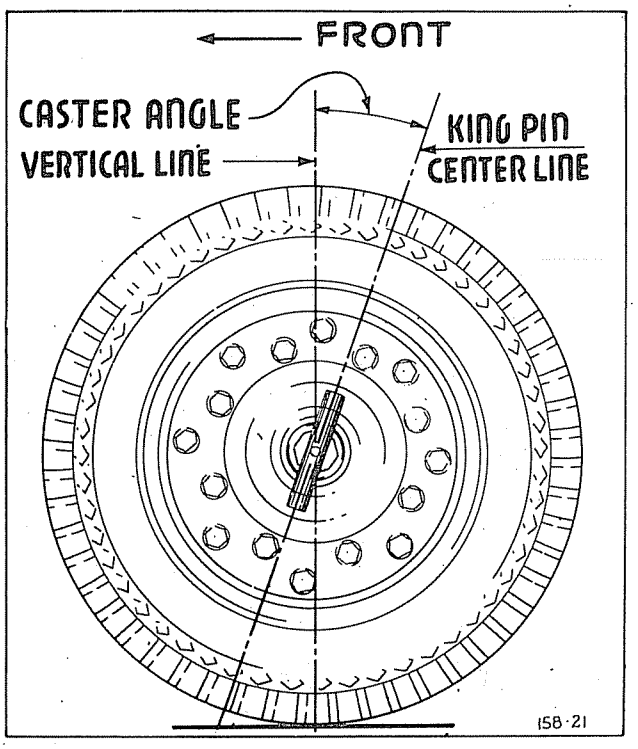


Fig. 11—Positive Caster Angle.

13. CHECKING CASTER.

Caster should be checked after the king pin inclination and camber have been checked. If either of these angles is incorrect, the condition should be corrected before attempting to adjust caster.

Important: Keep the foot brake applied during the following operation.

(1) With the front wheels in the centre of the turntables and in the straight-ahead position, attach gauge (using chain).

Gauge to be set vertical as for king pin inclination. Check first for vertical alignment, turn face of gauge to front of vehicle, as shown in Figure 12.

(2) Turn the front wheels to the left 20 degrees, as indicated on the turntable scale.

(3) Adjust the secondary screw until the bubble is centred. Do not disturb this setting.

(4) Turn the front wheels to the right until the right wheel is 20 degrees past the straight-ahead position .

(5) Adjust the primary screw until bubble is centred. The reading on the 40 degree scale of the quadrant is the caster angle. Readings from zero away from the wheel indicate positive caster.

(6) Check the left wheel in the same manner, but start by turning wheels to the right.

Caster adjustment is made by inserting a wedge between the spring and the axle (Figure 13). To increase caster, insert the wedge so the thick part faces the rear of the truck. To decrease the caster, place the wedge so that the thick end is toward the front of the truck. If an excessively thick wedge is required for a truck that has high mileage, check the contour of the springs and replace if necessary.

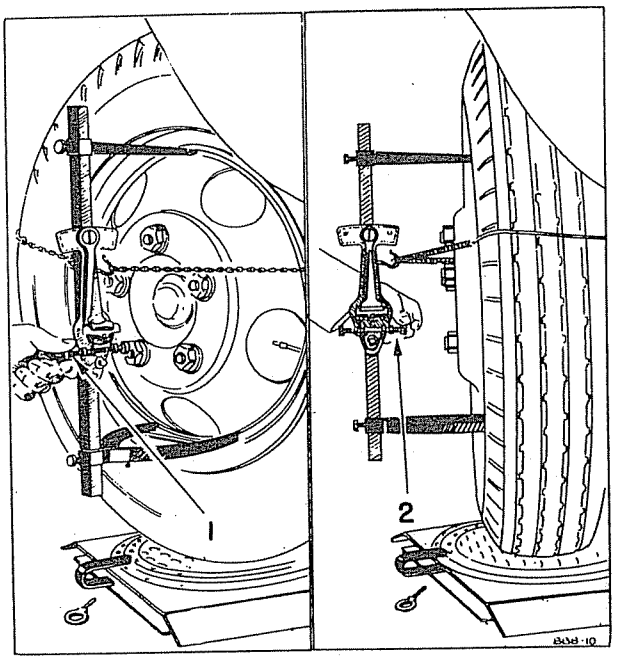


Fig. 12—Checking Caster—Gauge on Right Wheel.

1 — Secondary screw 2 — Primary screw

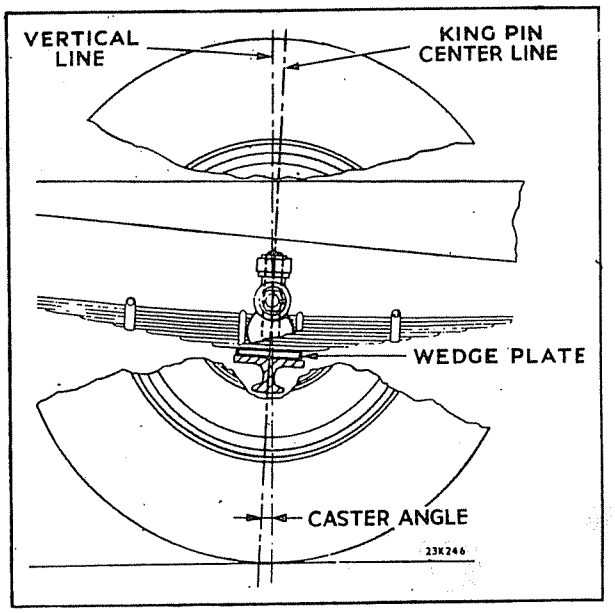


Fig. 13—Caster Angle Adjustment.

TOE-IN.

Toe-in is the amount (in fractions of an inch) that the front wheels are closer together at the front than they are at the back, as viewed from the top of the truck. (Figure 14).

The amount of toe-in required depends on the amount of camber or caster in the front wheels.

Excessive or insufficient toe-in causes lateral slipping or scuffing between the tyre and the road. This results in abnormal tyre wear, depending on the relationship between camber, caster and toe-in.

14. CHECKING TOE-IN.

When checking for causes of excessive tyre wear, king pin inclination, camber and caster should first be checked and corrected in the order named. No change should be made in toe-in until the other factors of front wheel alignment are known to be within specifications.

(1) Turn the front wheels to exactly the "straight-ahead" position.

(2) Check the toe-in of the front wheels after rolling the truck ahead one full revolution of the wheels (with only the weight of the truck on the tyres).

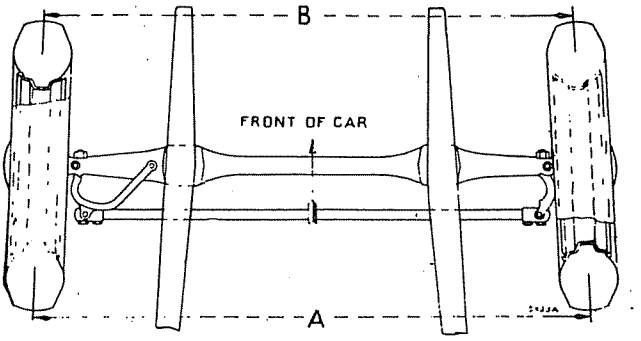


Fig. 14—Actual Front Wheel Toe-in Measurements.
A — First measurement B — Second measurement

(3) Actual toe-in measurements should be taken at hub height, between two points on the centre of the tread at the rear of the tyres (Figure 14).

Mark the point. Roll the truck ahead so that the points are in front at hub height and then measure the distance between the same two points on the tyre treads. The difference in the two measurements is the actual toe-in or toe-out.

Toe-in when measured with a Wee-Gee board (Figure 15) should be zero. See Service Standards section for toe-in specifications for all models.

15. ADJUSTING TOE-IN.

(1) Turn the steering wheel so that gear is in the mid-position.

(2) Loosen the clamping bolts on both ends of the tie rod and turn the tie rod the direction necessary to bring the toe-in within the specified limits.

(3) Tighten the clamping bolts on the tie rod ends.

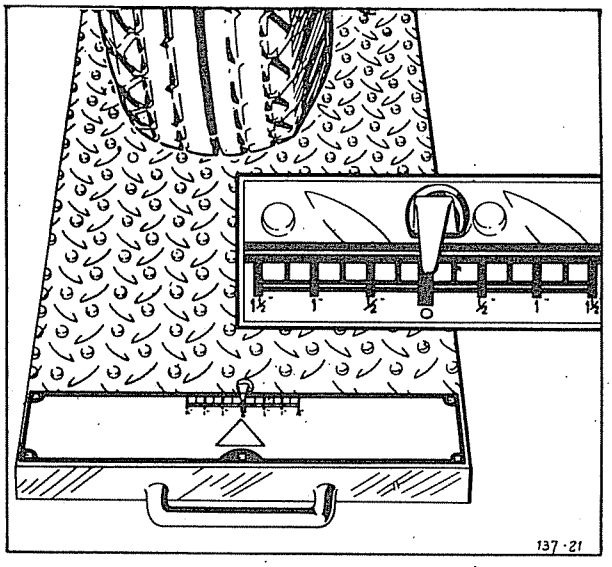


Fig. 15—Front Wheel Toe-In—Wee-Gee Board—Tool DD-398.

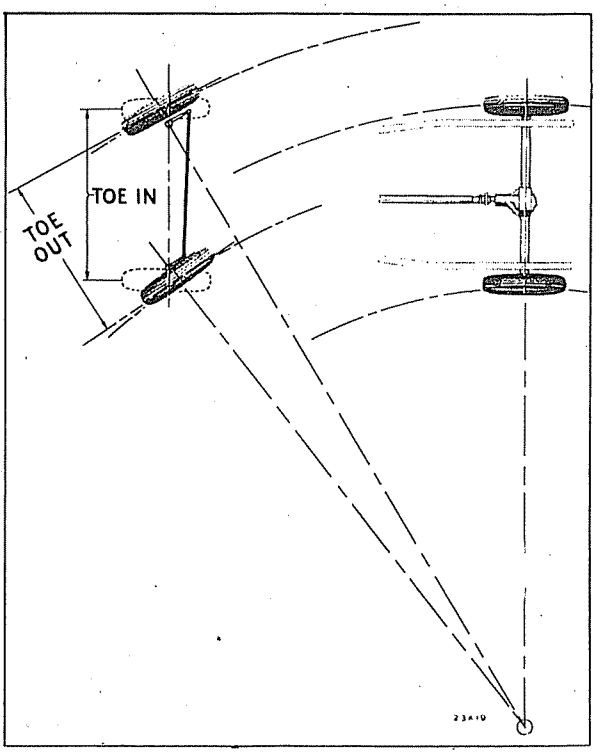


Fig. 16—Steering Geometry on Turns.

(4) Check the toe-in again to make certain that it is correct. If a Wee-Gee board (truck type), or similar wheel aligning equipment is used to measure toe-in, it is only necessary to put the wheels in the straight-ahead position and pull the truck forward on to the device.

16. TOE-OUT.

When the wheels are turned to the right or left, they actually toe-out farther apart at the front than at the rear (Figure 16).

The design of the steering knuckle arms regulates the amount of toe-out, depending on the wheelbase of the truck and the distance between the steering knuckles.

To be in correct relative alignment, when negotiating a turn, both front and rear wheels must travel in circles having a common centre. The inside front wheel travels in a circle having a smaller radius than the circle travelled by the outside front wheel. Therefore, the wheels will be farther apart at the front than at the back when turned off the straight-ahead position. The amount of front wheels toe-out on turns depends on how far the front wheels are turned.

A bent steering knuckle arm will cause excessive tyre wear even though the amount of toe-in is correct for the straight-ahead position of the front wheels. This occurs because when the front wheels are turned to the right or left, the error in toe-out,

due to the bent steering knuckle arm, would cause excessive scuffing action between the tyre and the road. It is therefore, extremely important to check toe-out as well as toe-in whenever the front wheels are aligned.

17. CHECKING TOE-OUT ON TURNS.

Before checking toe-out (wheel alignment on turns), all other factors of front wheel alignment should be checked in their proper sequence:

(1) King pin inclination.

(2) Camber.

(3) Caster.

(4) Toe-in.

Checking devices, such as Wee-Gee board (truck type) and similar devices that measure the amount of slippage between the tyre and the road, may be used to check alignment of front wheels on turns. Such a check will determine the amount of slippage between the tyre and the road when the wheels are turned to the right or left. To check the amount of toe-out on turns using a truck type wheel aligning board, proceed as follows:

(1) Turn the front wheels to the left until the left wheel is 20 degrees from the straight-ahead position.

(2) Place the aligning board in front of the right wheel. Drive the truck on to the aligning board so that the right wheel travels the length of the board.

If the pointer on the board moves more than $\frac{1}{2}''$ after the wheel has travelled the length of the board, the toe-out is incorrect, indicating a bent steering knuckle arm on the left side.

(3) Repeat the foregoing operations on the right wheel, turning the wheels 20 degrees to the right and placing the aligning board under the left wheel. If the pointer moves more than $\frac{1}{2}''$ it would indicate a bent steering knuckle arm on the right side.

When using an aligning board to check toe-in or toe-out, the direction of movement of the pointer indicates whether the condition is excessive toe-in or excessive toe-out. Movement of the pointer toward the centre of the truck indicates toe-out. Movement of the pointer in the opposite direction (away from the centre of the truck) indicates toe-in.

CHECKING TOE-OUT ON TURNS WITH TURNTABLES DD-435.

Before checking toe-out (wheel alignment on turns) make certain all other factors are checked in their proper sequence as stated above.

To check toe-out on turns using turntables, tool No. DD-435, proceed as follows:

(1) Place front wheels on locked turntables in the straight-ahead position. Be certain wheels are in the centres of the turntables.

(2) Set the foot brake so that the wheels cannot rotate.

(3) Remove the turntable lock pins and turn wheels 20 degrees to the left as indicated on the left hand turning table.

With the left hand or inside front wheel of the turn set at 20 degrees, the right hand front or outside wheel of the turn reading, as indicated on the turntable, should be according to the model, as follows:

	Left Hand Reading	Right Hand Reading
1-08A	20 degrees	23
2-26A	20 degrees	23
2-33A	20 degrees	23
3-59A	20 degrees	23
6-71A	20 degrees	$23\frac{1}{2}$
8-65A	20 degrees	$23\frac{1}{2}$
8-71A	20 degrees	$23\frac{1}{2}$
8-71A-D	20 degrees	$23\frac{1}{2}$

(4) Repeat the foregoing operations on the right front wheel set on the turntable at 20 degrees and the reading of the left hand turntable should be as indicated by reversing the above readings.

A reading indicating less than the degrees for the outside front wheel on the turn as set out in the above table, would indicate toe-in. A reading greater would indicate toe-out.

SERVICE DIAGNOSIS

Conditions — Possible Causes — Remedies

18. WHEEL BOUNCE.

Possible Causes.

(a) Unequal tyre pressure.
(b) Unbalanced wheels or tyres.
(c) Weak front spring.
(d) Inoperative shock absorber.

Remedies.

(a) Refer to Tyre Pressure, Service Standards section.

(b) Refer to Wheel Balancing, Wheels and Tyres section.

(c) Check front springs as outlined in Frame, Springs and Shock Absorbers section. Shim as necessary or replace spring.

(d) Test shock absorbers as outlined in Frame, Spring and Shock Absorbers section. Replace if necessary.

19. EXCESSIVE TYRE WEAR.

Possible Causes.

(a) Failure to rotate tyres.
(b) Incorrect camber.
(c) Incorrect toe-in or toe-out.
(d) Improper tyre inflation.
(e) Turning corners too fast.
(f) Wheel wobble.
(g) Worn king pins.
(h) Harsh or unequal brakes.
(i) Sustained high-speed driving.

Remedies.

(a) Spotty wear occurs on front wheels, as shown in Figure 17. This condition does not progress to any great extent prior to 2,500 miles. This type of wear is the natural result of free rolling wheels and tyres. Wheel alignment or front wheel balancing will NOT correct this condition.

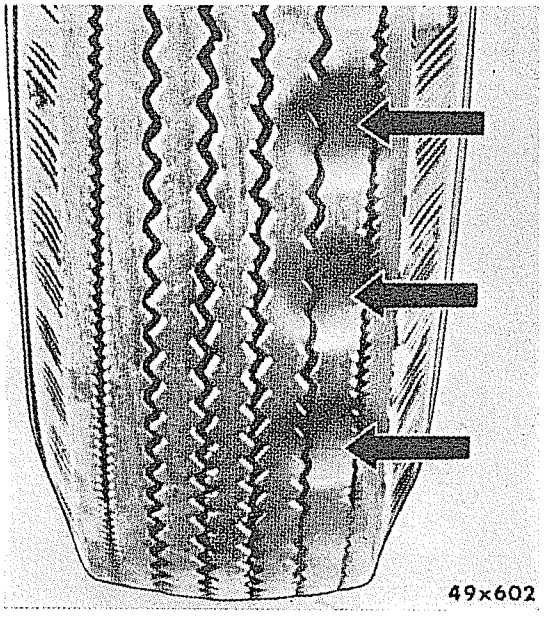


Fig. 17—Spotty Wear

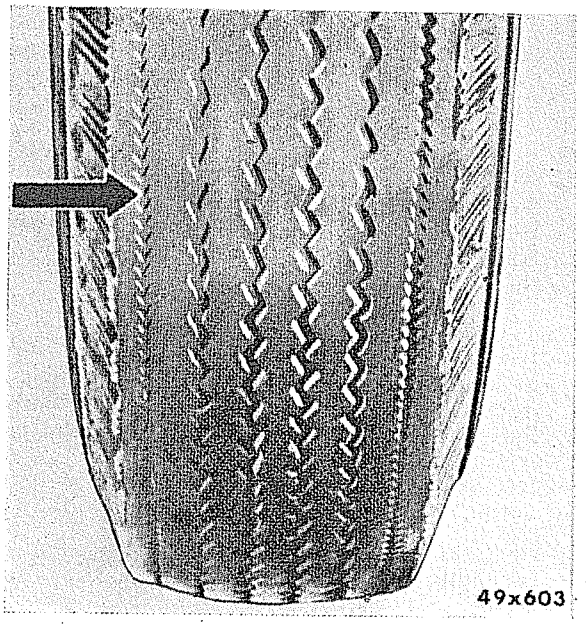


Fig. 18—Camber Wear.

The only known method to control the formation of spotty wear is to rotate tyres every 2,500 miles.

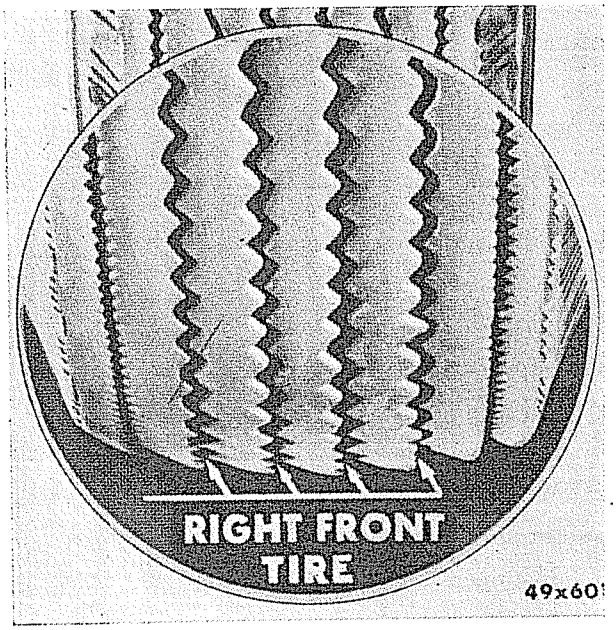


Fig. 19—Toe-in Wear.

(b) Excessive positive camber will develop noticeable wear on the outer ribs of tyres, as shown in Figure 18. Excessive negative camber will develop noticeable wear on the inside ribs of tyres. Camber should be adjusted ONLY if this type of wear is evident.

Refer to Front Wheel Alignment in this section.

(c) The amount of front wheel toe-in or toe-out affects the rate of tyre wear more than any other single cause. See Figure 19 for toe-in wear and Figure 20 for toe-out wear. Refer to Front Wheel Alignment in this section.

(d) Refer to Tyre Pressure, Service Standards section. Tyres are subject to under-inflation wear, as shown in Figure 21. This type of wear is characterized by excessive wear on the two tread ribs adjacent to the inner and outer shoulder ribs.

When a condition of this kind develops, it is an indication that the tyre has been run at a lower pressure than that for which it is designed. Over-inflation wear can be detected by excessive wear at the centre of the tread.

(e) Excessive speed on turns will cause a scuffing action on the tyres resulting in rapid wear.

(f) Straighten wheel or replace wheel and tyre assembly as required.

(g) Replace worn king pins and bushings.

(h) Refer to Brakes section.

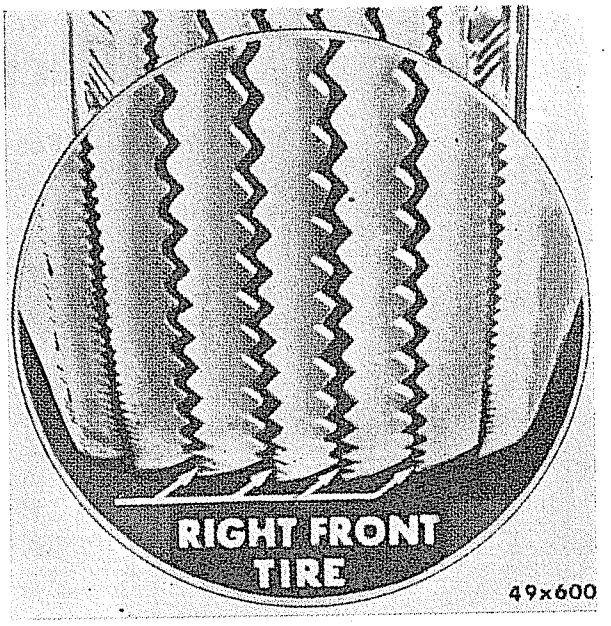


Fig. 20—Toe-Out Wear.

(i) If tyre economy is desired, prolong tyre life by driving at moderate speeds.

20. FRONT END NOISY.

Possible Causes.

(a) Improper lubrication.
(b) Loose tie rod ends.
(c) Front shock absorber noisy.

Remedies.

(a) Refer to Lubrication section.
(b) Check tie rod ends for looseness and replace as necessary.

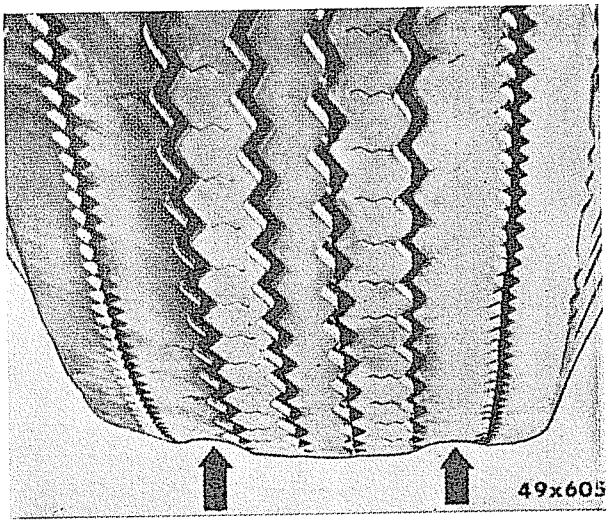


Fig. 21—Under-Inflation Wear.

(c) The rubber bushings on which the shock absorbers are mounted to the anchor studs may be worn and allowing metal to contact metal. In which case, replace the bushings.

Test shock absorbers as outlined in Frame; Spring and Shock Absorbers Section. Replace if necessary.

Note: The rubber bushings on the springs and shock absorbers must not be lubricated or allowed to come in contact with any form of mineral oil. Mineral base oils will cause rapid deterioration of the rubber.

MAINTENANCE.

The axle, steering knuckle and arms are heat-treated to obtain the inherent characteristics required for front axle construction. Should any of these parts become bent, they should be replaced. Heating these parts for straightening or correcting an irregularity will make them unfit for use because this additional heating destroys the results of the initial heat treatment.

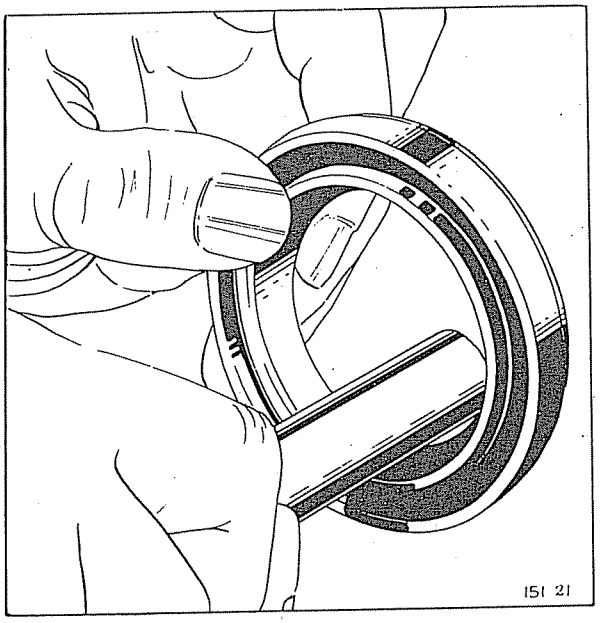


Fig. 22—Rolling Oil Seal.

21. PREPARATION AND INSTALLATION OF OIL SEALS.

Leather Oil Seals.

When installing new leather oil seals, care must be taken to make certain that the leather is soaked in thin oil for about 30 minutes before assembling on the truck. Then, "work" the leather by rolling it with a smooth bar (Figure 22). The leather should be soft and pliable and the edges in good condition, in order to obtain a good tight seal and prevent oil leakage. Inspect the surface of the steering knuckle where it contacts the oil seal to make certain that it is smooth. Roughness will cause rapid wear of the seal and oil leakage.

Synthetic Oil Seals.

No preparation of seal is necessary. The same care used in the leather seal installation should be exercised.

22. TO CHECK FOR WORN KING PIN BUSHINGS.

Excessive play between king pins and bushings may be checked as follows:

(1) Remove hub cap, grease cap and cotter pin for front wheel bearing adjusting nut.

(2) Tighten wheel bearing adjusting nut to remove play in wheel bearing.

(3) Holding the tyre at the extreme top and bottom sides, move the wheel in and out. There should be no more than $\frac{1}{8}$ inch shake in the wheel, measured at the top of the tyre tread.

NOTES