PART I. OPERATOR'S INSTRUCTIONS
For Series 53 Engines
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GENERAL SPECIFICATIONS

	3-53	4-53	6V-53
Type	2 Cycle	2 Cycle	2 Cycle
Number of cylinders	3	4	6
Bore (inches)	3.875	3.875	3.875
Bore (mm)	98	98	98
Stroke (inches)	4.5	4.5	4.5
Stroke (mm)	114	114	114
Compression Ratio (nominal)(standard engines)	17 to 1	17 to 1	17 to 1
Compression Ratio (nominal)("N" engines)	21 to 1	21 to 1	21 to 1
Total Displacement - cubic inches	159	212	318
Total Displacement - litres	2.61	3.48	5.22
Number of main bearings	4	5	4

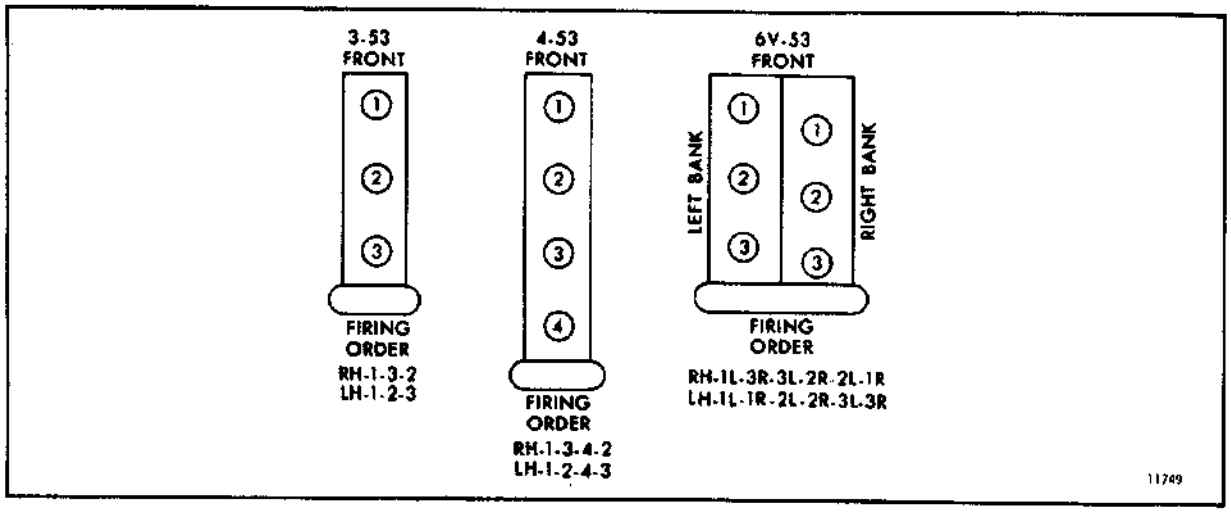


Fig. 4. Series 53 Cylinder Arrangement

or by-passes the heat exchanger and flows directly to the water pump, depending on the coolant temperature.

While passing through the core of the heat exchanger, the coolant temperature is lowered by raw water, which is drawn by the raw water pump from an outside supply. The raw water enters the heat exchanger at one side and' is discharged at the opposite side.

To protect the heat exchanger element from electrolytic action, a zinc electrode is located in both the heat exchanger inlet elbow and the raw water pump inlet elbow and extends into the raw water passage.

The length of time a heat exchanger will function satisfactorily before cleaning will be governed by the kind of coolant used in the engine and the kind of raw water used. Soft water plus a rust inhibitor or a high boiling point type antifreeze should be used as the engine coolant.

When foreign deposits accumulate in the heat exchanger to the extent that cooling efficiency is impaired, such deposits can, in most instances, be removed by circulating a flushing compound through the fresh water circulating system without removing the heat exchanger. If this treatment does not restore the engine's normal cooling characteristics, contact an authorized *Detroit Diesel Allison Service Outlet.*

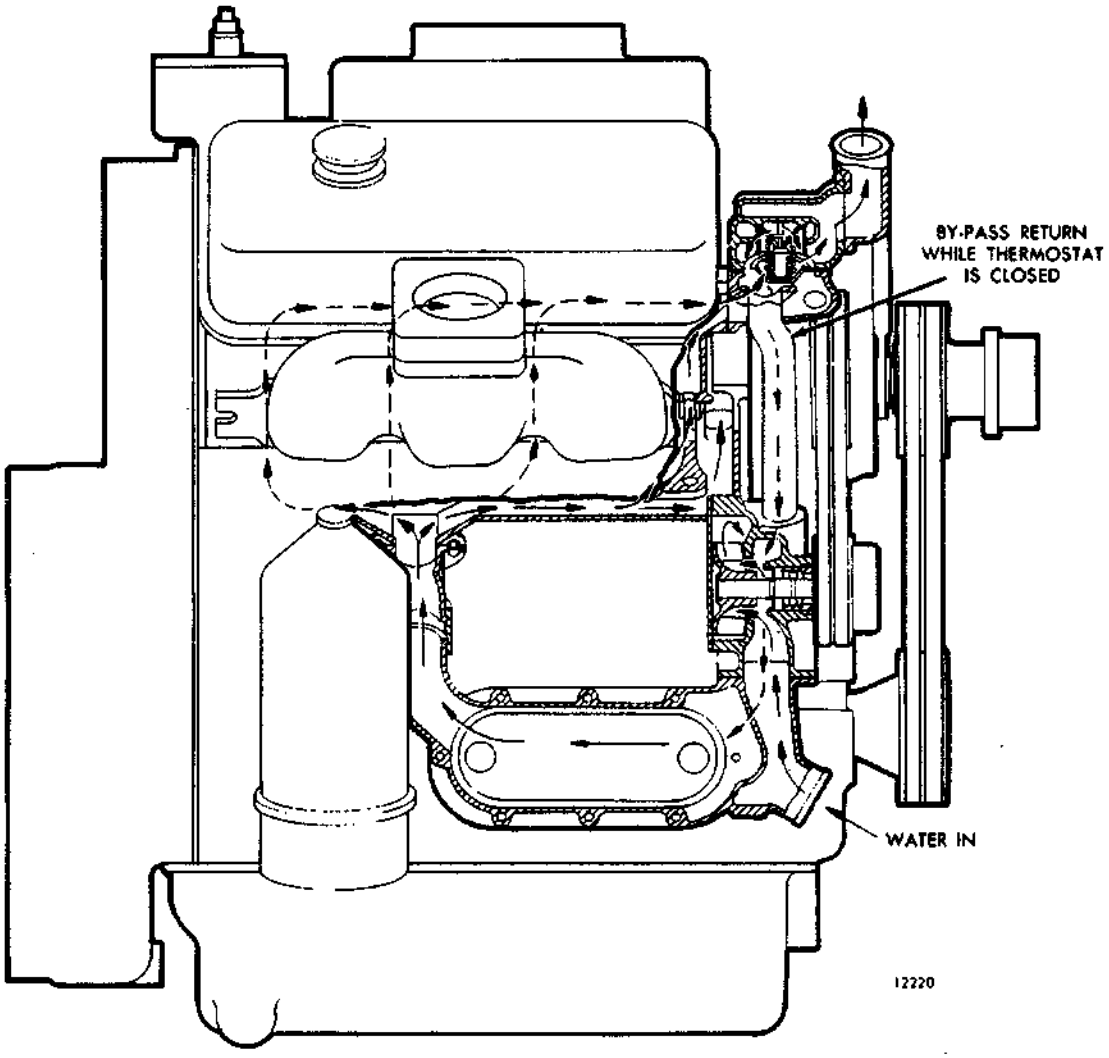
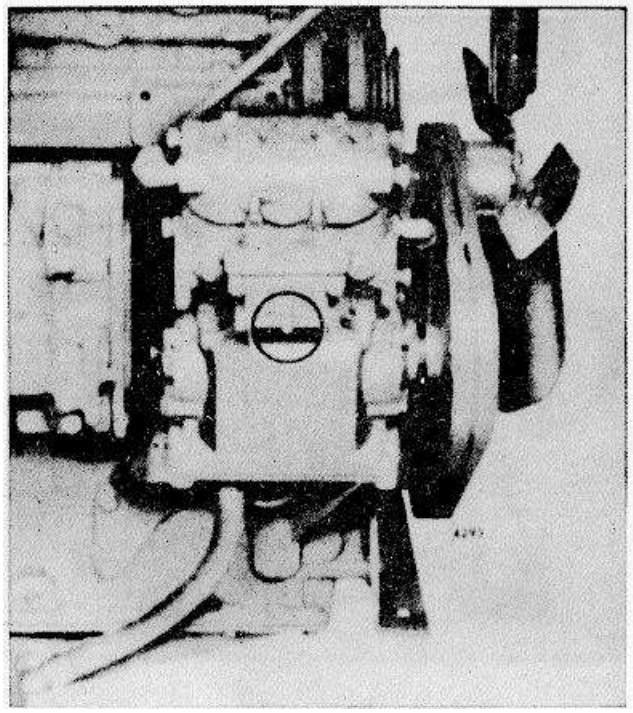
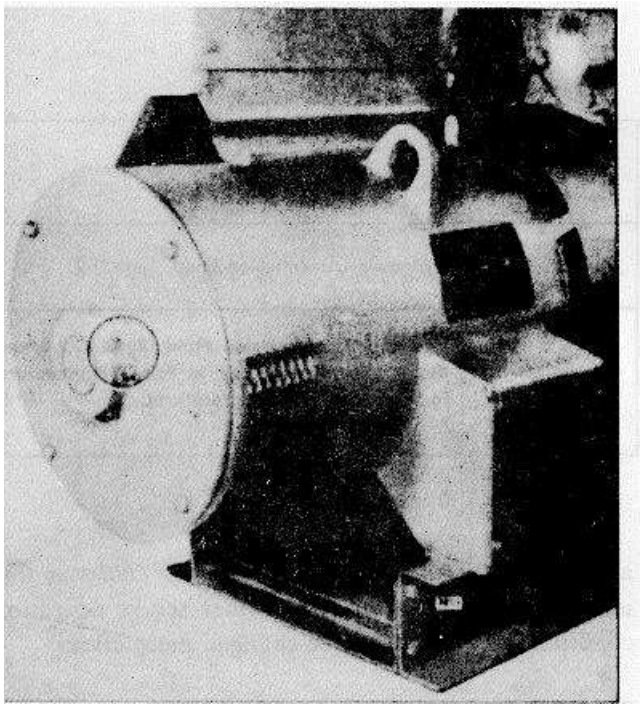


Fig. 19 - Typical Cooling System for V-Type Engine



Item 25



Item 27

When service is required, contact an authorized *Detroit Diesel Allison Service Outlet.*

Item 27

The power generator requires lubrication at only one point - the ball bearing in the end frame. If the bearing is oil lubricated, check the oil level in the sight gage every 300 hours; change the oil every six months. Use the same grade of oil as specified for the engine. Maintain the oil level to the line in the sight gage. **Do not overfill.** After adding oil, recheck the oil level after running the generator for several minutes.

If the bearing is grease lubricated, a new generator has sufficient grease for three years of normal service. Thereafter, it should be lubricated at one year intervals. To lubricate the bearing, remove the filler and relief plugs on the side and the bottom of the bearing reservoir. Add grease until new grease appears at the relief plug opening. Run the generator a few minutes to vent the excess grease; then reinstall the plugs.

The following greases, or their equivalents, are recommended:

Keystone 44H..... Keystone Lubrication Co.
BRB Lifetime..... Socony Vacuum Oil Co.
NY and NJ F926 or F927..... NY and NJ Lubricant Co.

After 100 hours on new brushes, or brushes in generators that have not been in use over a long period, remove the end frame covers and inspect the brushes, commutator and collector rings. If there is no appreciable wear on the brushes, the inspection interval may be extended until the most practicable
period has been established (not to exceed six months). To prevent damage to the commutator or the collector rings, do not permit the brushes to become shorter than 3/4 inch.

Keep the generator clean inside and out. Before removing the end frame covers, wipe off the loose dirt. The loose dirt and dust may be blown out with low pressure air (25 psi or 172 kPa maximum). Remove all greasy dirt with a cloth.

Lubricate all of the power take-off bearings with an all purpose grease such as Shell Alvania No. 2, or equivalent.

ADJUSTMENT OF MECHANICAL GOVERNOR SHUTDOWN SOLENOID

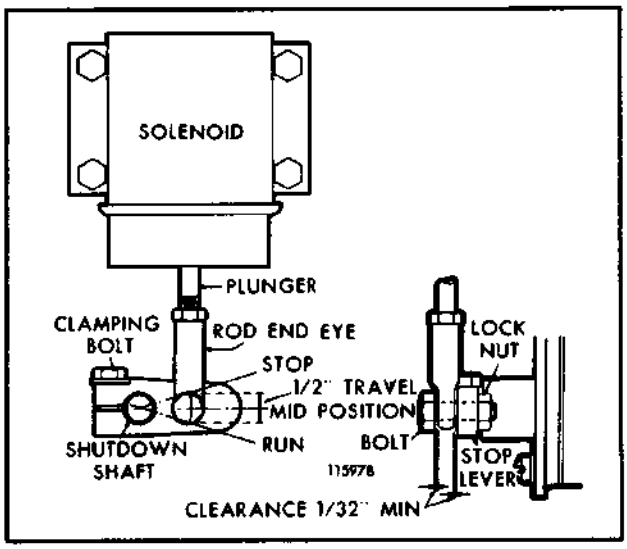


Fig. 6 - Typical Speed Governor Lever Position

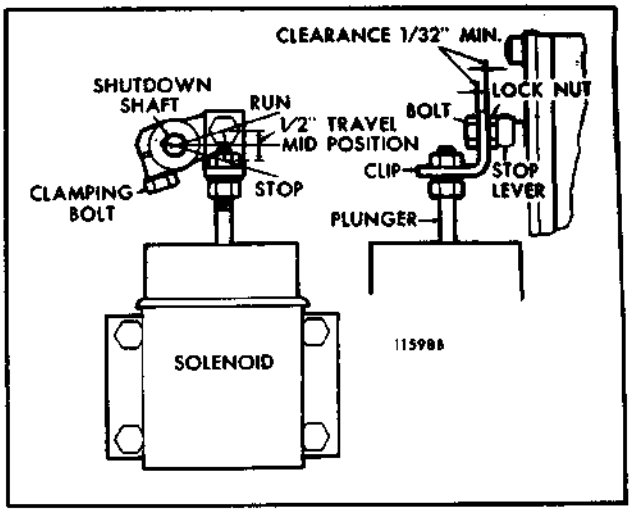


Fig. 7 - Typical Limiting Speed Governor Lever Position

When a governor shutdown solenoid is used on an engine equipped with a mechanical governor, the governor stop lever must be properly adjusted to match the shutdown solenoid plunger travel.

The solenoid plunger can be properly aligned to the governor stop lever as follows:

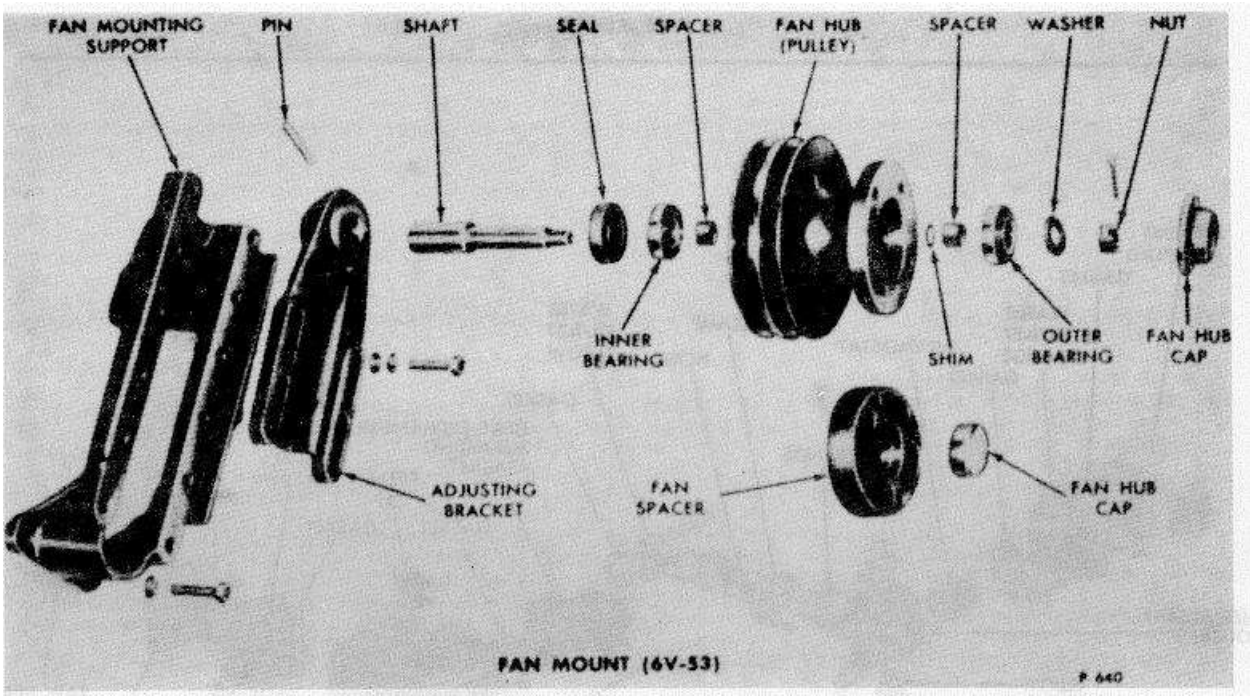
1. Remove the bolt connecting the rod end eye (variable speed governor), or the right angle clip (limiting speed governor) to the stop lever (Figs. 6 and 7). Align and clamp the lever to the shutdown shaft in such a way that, at its mid-travel position, it is perpendicular to the solenoid plunger. This assures that the linkage will travel as straight as possible. The solenoid plunger has available 1/2" travel which is more than adequate to move the injector control racks from the full-fuel to the complete no-fuel position and shutdown will occur prior to attaining complete travel.

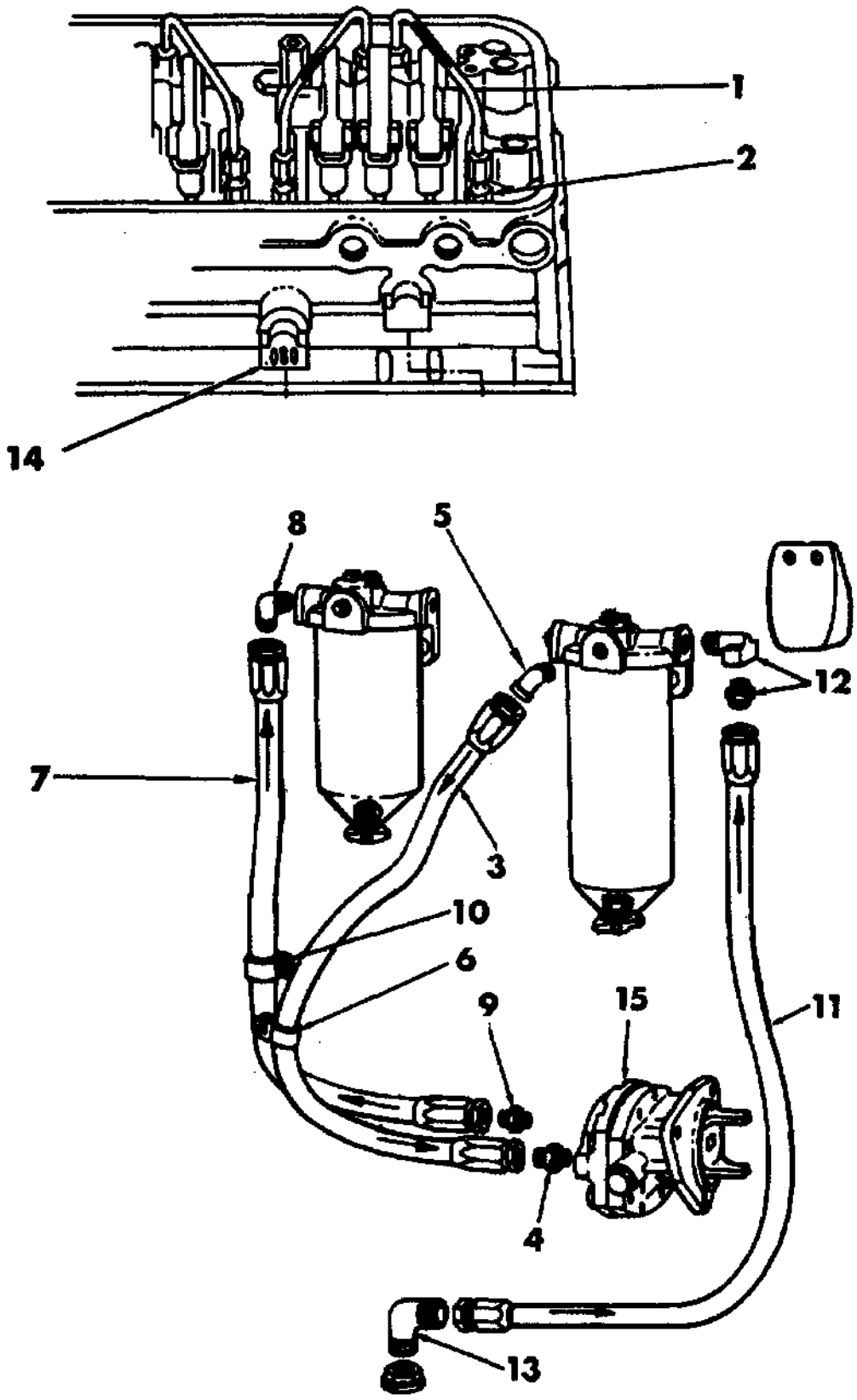
2. With the stop lever in the run position, adjust the rod end eye or right angle clip for minimum engagement on the solenoid plunger when the connecting bolt is installed. The oversize hole in the eye or clip will thereby permit the solenoid to start closing the air gap, with a resultant build-up of pull-in force prior to initiating stop lever movement.

3. The bolt through the rod end eye or the right angle clip should be locked to the stop lever and adjusted to a height that will permit the eye or clip to float vertically. The clearance above and below the eye or clip and the bolt head should be approximately 1/32 " minimum.

NOTE: The lock nut can be either on top of or below the stop lever.

4. Move the lever to the stop position and observe the plunger for any possible bind. If necessary, loosen the mounting bolts and realign the solenoid to provide free plunger motion.


FAN MOUNTING SUPPORT
PIN
SHAFT
SEAL
SPACER
FAN HUB (PULLEY)
SPACER
WASHER
NUT
INNER BEARING
SHIM
OUTER BEARING
FAN HUB CAP
ADJUSTING BRACKET
FAN SPACER
FAN HUB CAP
FAN MOUNT (6V-53)
P 640



(FIG. NO. 14)

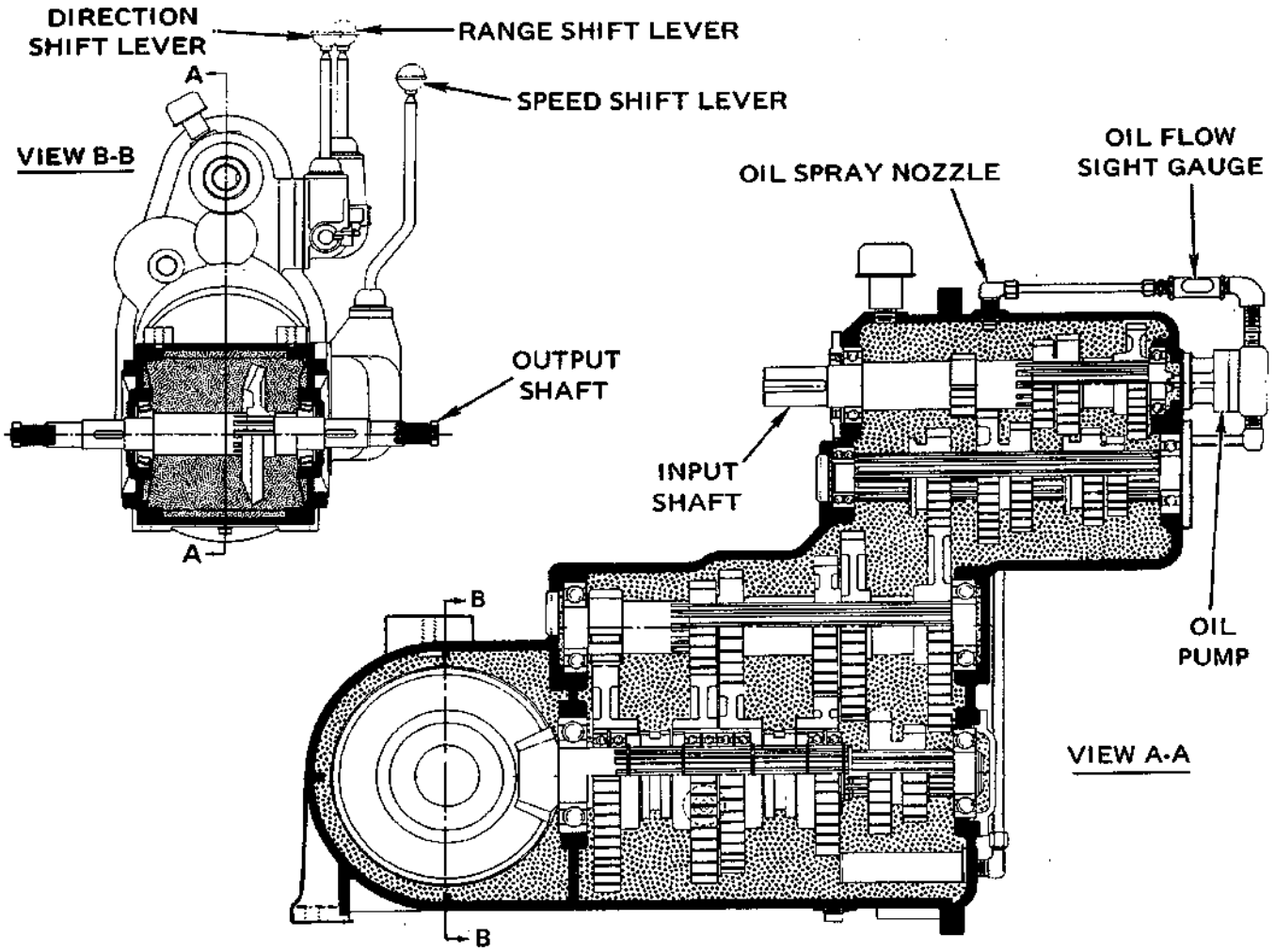


Figure 7. 24 Speed Transmission-Manual Shifts

TRANSMISSION

The paver transmission will permit movement in either forward or reverse directions at 24 different speeds ranging from 11 to 336 feet per minute. The four highest speeds (153 thru 336 FPM) are for travel only, not for paving! The top travel speed at full throttle is 4 miles per hour (aprox.) All movement is accomplished with the engine either at IDLE speed or FULL throttle (2000 RPM). -There is no other engine speed adjustment.

The transmission has three shift levers (See Figure 7)..

1. Direction Lever—Two positions: Forward, Reverse
2. Range Lever—Four positions: 1st (Low Speed), 2nd, 3rd, 4th (High Speed)
3. Speed Lever—Six Positions: 1st (Low Speed), 2nd, 3rd, 4th, 5th, 6th (High Speed)

By selecting combinations of shift lever positions as shown on the Speed Selection Plate (Figure 8) the paver speed is determined by the operator. The Selection Plate decal is located on. The top surface of the engine cover for convenient reference.

An electrical system limit switch is operated by a shaft extension from the Direction Lever gearbox. When the direction lever is shifted into REVERSE, the switch contacts are opened so that the material feed conveyors and the screed vibrator units cannot operate when the paver is moving in reverse.

WARNING! Do not stand in the hopper to shift the paver transmission levers.
This is dangerous, due to the possibility of slat conveyor movement.

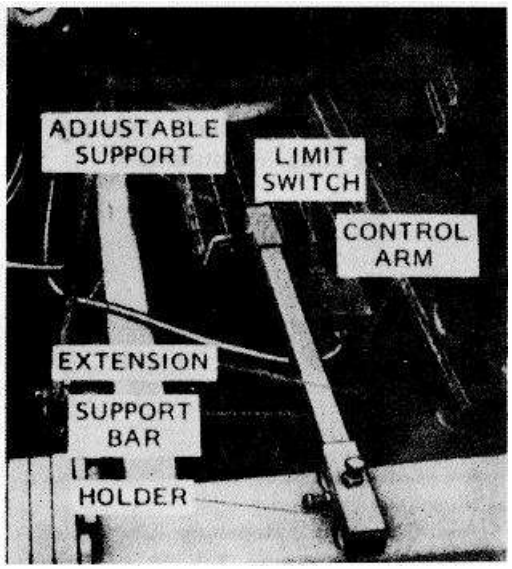
MANUAL OPERATION OF MATERIAL FEED

The two parallel but separate material feed systems are controlled by toggle switches on the operators console. These switches engage and disengage electric clutches. (See Figures 3 and 4). The switches are three position; MANUAL-OFF-AUTO. When the paver is in Forward gear with engine running each feed system combination of one slat conveyor and one screw conveyor will operate whenever the toggle switch is set to MANUAL. The **operator** must observe the feed and operate the switch to keep material ahead of the screed but not flowing over the mold board.

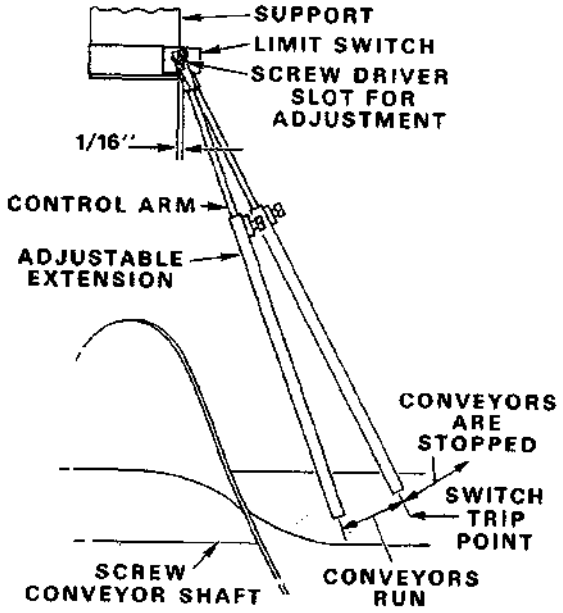
AUTOMATIC OPERATION OF MATERIAL FEED

The depth feeler assembly can be quickly set for automatic operation as follows: (See Fig. 12 & 13)

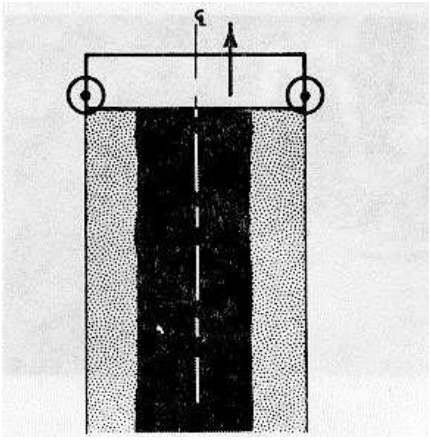
1. Loosen the control arm clamp so that it is loose on the switch shaft.
2. Lower the arm to within A" of the positive stop which keeps it from swinging farther downward. (A spacer can be used to hold the 1/16 setting).
3. Turn the switch shaft until an audible click indicates that the internal contacts have closed, then while holding that setting, tighten the clamp on the control arm.
4. Start engine and move feed switch on the console to AUTO.
5. Manually raise and lower control arm to make sure switch starts and stops conveyor at the point set.
6. To set the depth of material desired, move the Extension which is clamped to the Control Arm. When the extension is moved **closer** to the switch a **higher** level of material at that point will



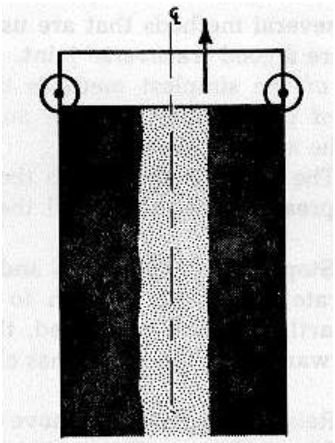
Adjustable Material Depth Control Switch with Feeler Arm - RH Assembly Shown
Figure 12



Recommended Setting Of Control Assemblies
Figure 13



Edges Loose - Decrease Front Crown



Center Loose - Add More Front Crown

Effect of Crown on Mat Uniformity

Figure 5

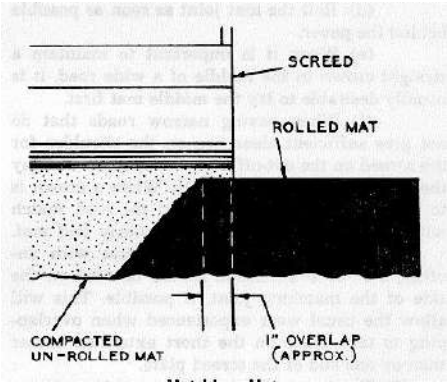
add front crown by turning the nut 1/6th turn at a time until the mat has the desired appearance. Adjustment should be made slowly, waiting each time for the effects of the new setting.

Tight mat edges and a marking or looseness at the center of the mat indicates a need for more front crown. Add crown to the front edge of the screed 1/6-th turn of the adjusting nut at a time, waiting each time for the effects of the new setting, until the mat has the desired appearance.

The rear crown adjustment should not be changed unless a new or different degree of crown is desired in the finished mat. Front crown adjustment does not affect the road crown, it only helps to get proper distribution of material under the screed. The front crown must always be adjusted after the rear crown adjustment is correct.

The initial crown settings are 1/16 to 1/8" more in the front crown than in the rear crown. For example: The rear crown setting is for 1/4" crown in the road, therefore the front crown would be 1/16"more or 5/16" total.

Final adjustment must be made when the paver is actually laying mat. This eliminates the possibility of crown error and enables the operator to observe the quality of the surface. If the density and texture are not uniform, adjustment of the lead crown differential should be made to determine whether the mat can be improved by this simple change in screed attitude.



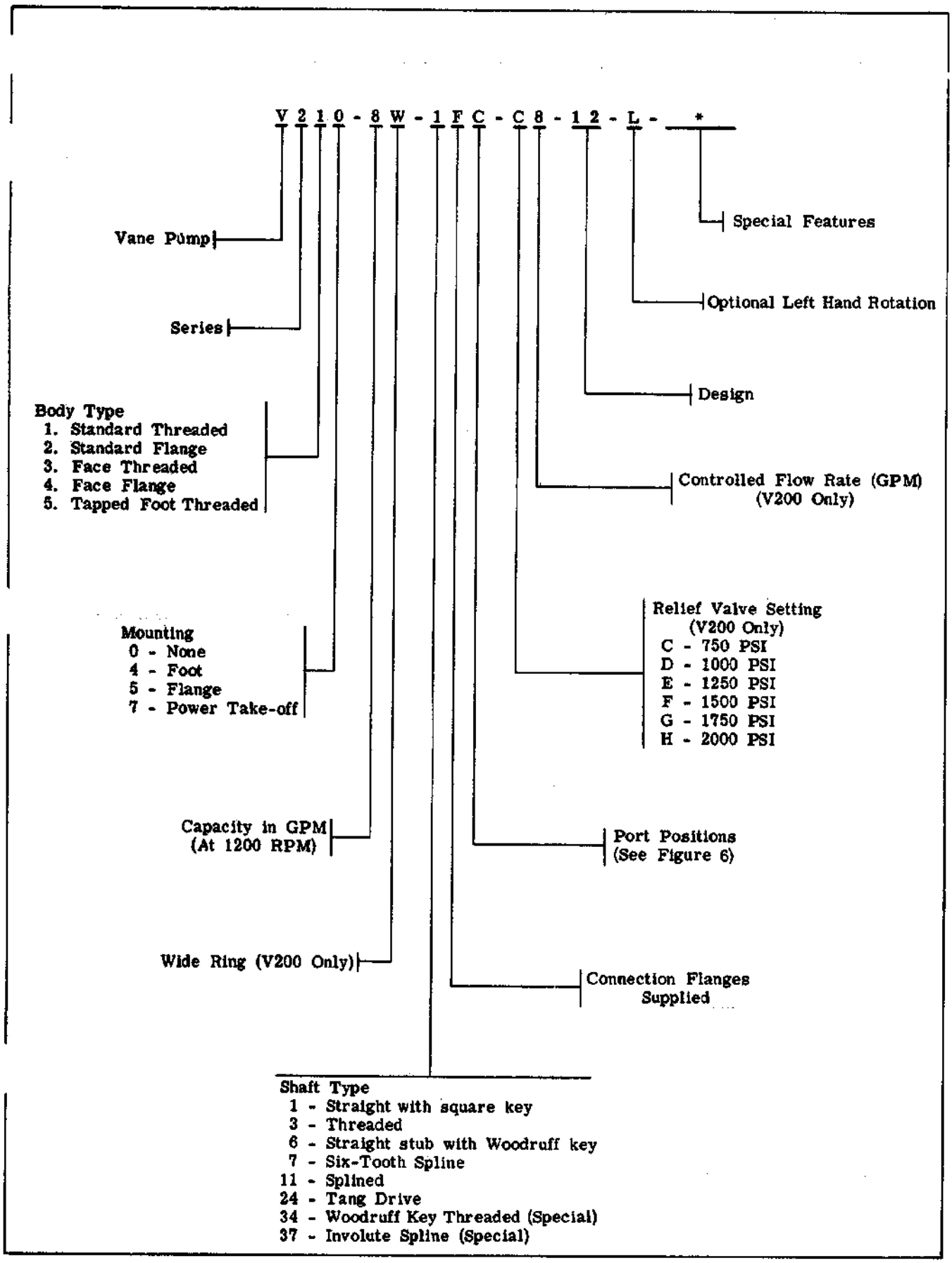
Matching Mats

In any paving operation where two or more mats are joined together, this procedure is called matching a joint (Figure 6). The joint may be either parallel or transverse, depending upon the phase of operation. When matching any joint the operator should always have sufficient thickness so when the mat is rolled it will be the same depth as adjoining mat. Extra thickness depends upon how thick a mat is being laid. Example: a 4" black base mat may require 5" of fresh material in order to measure 4" after final rolling. A 1½2" mat may require only 13,14" of material.

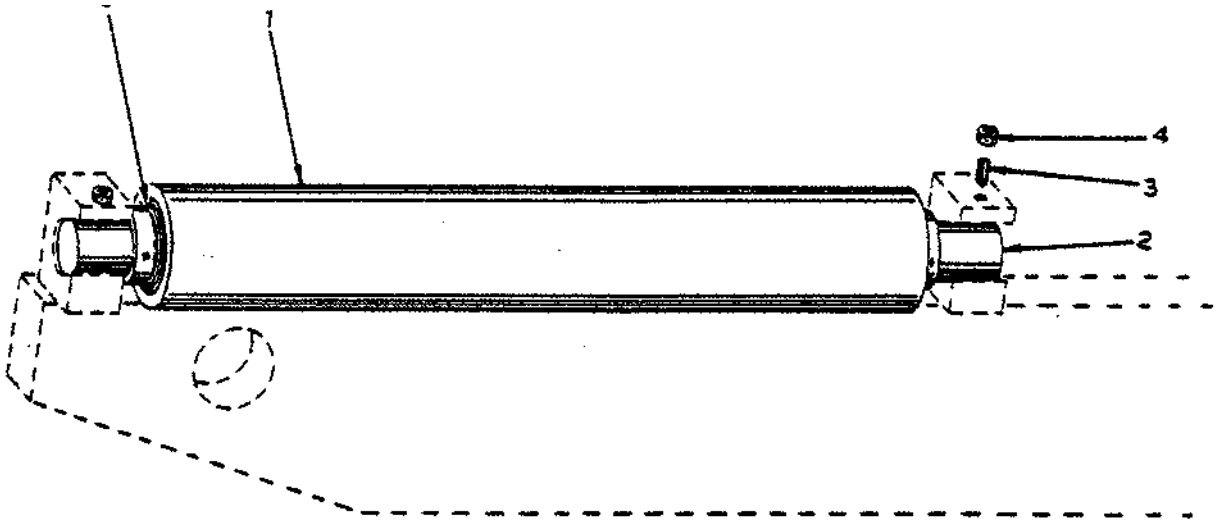
(1) Parallel Joints-The "CEDARAPIDS" Bituminous Paver is designed to match one mat to another mat by overlapping the previously laid mat. The amount of overlay will depend some upon skill of the operator. (Refer to Figure 6.) The operator should also consider the following examples when laying mats with parallel joints.

(a) Match the mats when possible before the asphalt sets up. If it is possible to do this, the roller should be kept away from the first mat approximately 6" to 1'.

TABLE II - MODEL CODE BREAKDOWN



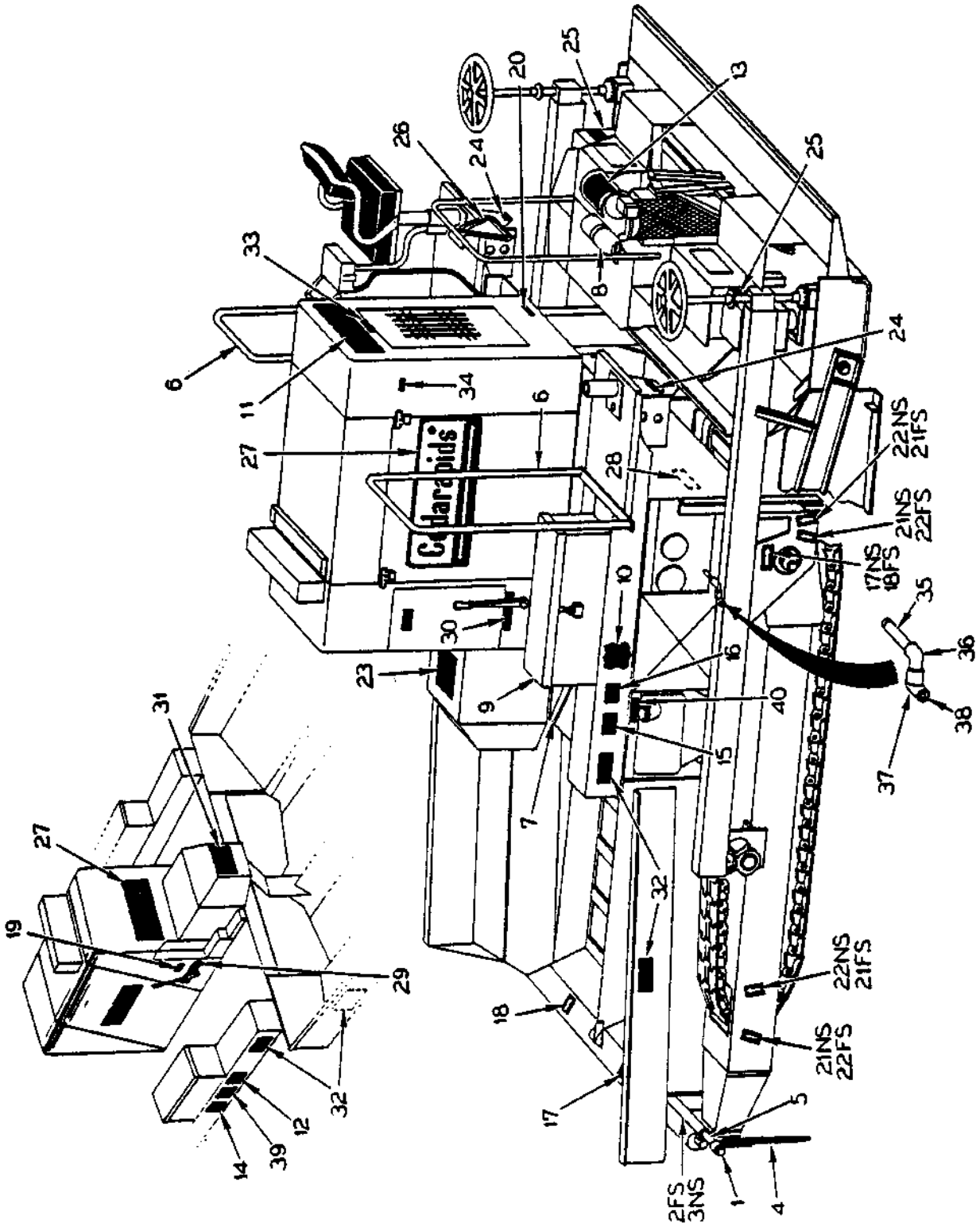
BEAM ROLLER ASSEMBLY



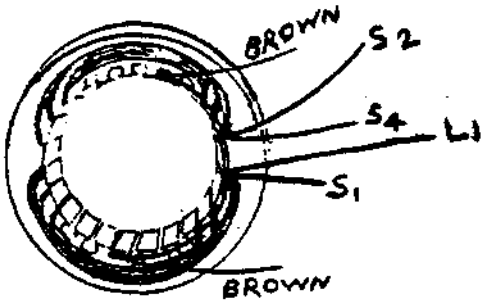
REF. NO.	PART NUMBER	DESCRIPTION	QUANTITY
1	5036AD32	Tube	1
2	41218-037-00	Shaft	1
3	7130-105	Setscrew, Socket Type 1/2" x 1-1/4 "-NC - Cone Point	4
4	7017-027	Nut, Jam 1/2" - NC	4
5	7302-013	Bearing	2

NOTE: Quantities shown are for one Assembly only.

TRACTOR ACCESSORIES



STATOR ASSEMBLY



Note: When ordering replacement stator assemblies be sure to include the model and serial number from the nameplate on the side of the generator.

The stator assembly has a winding to develop voltage for the base field. The lead extensions from this winding are colored brown. Connection from this winding is to the base bridge.

A single, two pole winding is used for two wire, single voltage models. This winding connects to the control (Series) field bridge. The control bridge is divided into a positive and a negative side and is in series with the load. (See bridge assembly illustration)

Three wire, dual voltage models use two identical, two pole windings. Each winding generates 125 volts. The voltage from either line to neutral is, therefore, 125. From L1 to L: the winding is in series for 250 volt output.

When a fault in the stator is suspected each individual winding should be checked. The resistance of 'the separate windings will be low, less than one ohm, but a complete circuit should be indicated. IE: #S1 to #S2, #S4 to #L1.

The various windings should also be checked for ground. For this purpose connect an ohmmeter from a bare spot on the frame to one lead of each coil. A meter deflection indicates a grounded winding.

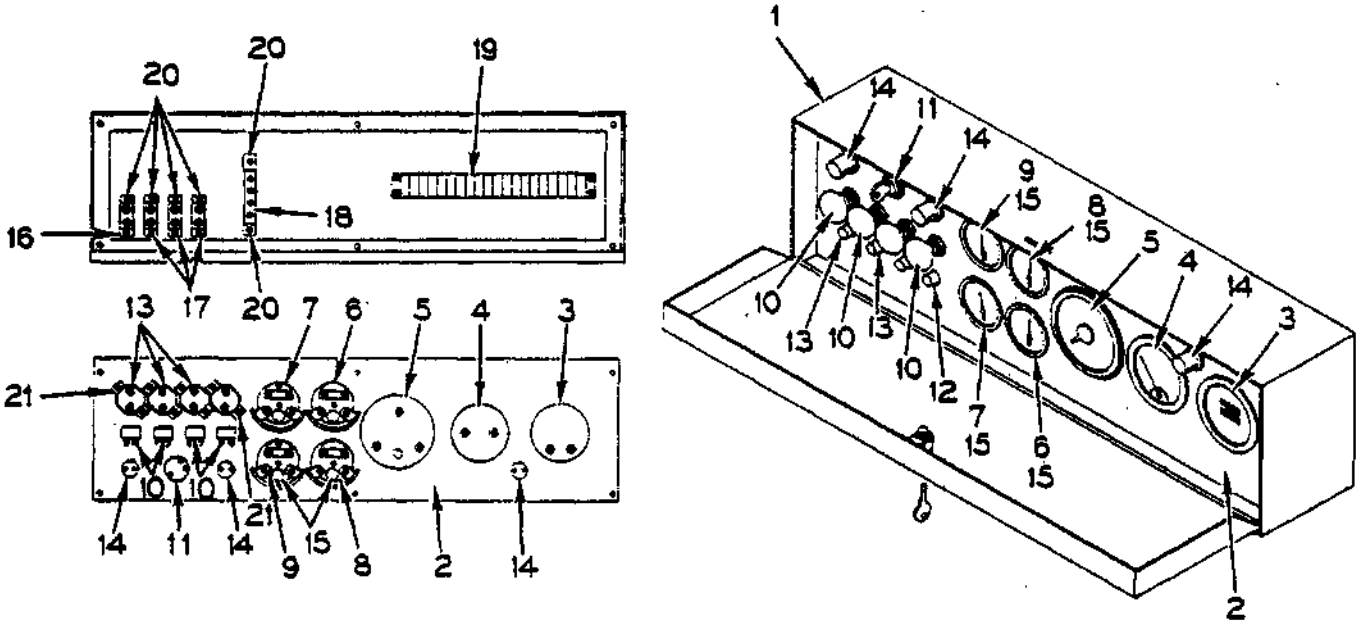
When all stator leads are disconnected, there should be no circuit from one winding to any other. If a circuit is indicated, the winding is shorted.

If any of the above conditions are indicated, the stator assembly must be replaced.

METER BOX
MILITARY PAVER-VSF-400

METER BOX

MILITARY PAVER — BSF-400



REF.NO.	PART NUMBER	DESCRIPTION	QUANTITY
	9704-402-33	Meter Box - Complete	1
1	9704-402-34	Box	1
	9704-402-32	Meter Panel	1
3	46225-003-02	Frequency Meter	1
4	46225-001-07	AC Voltmeter	1
5	45865-001-23	Hour Tachometer	1
6	46225-002-07	Ammeter	1
7	45865-002-16	Oil Pressure Meter	1
8	45865-003-04	Water Temperature Meter	1
9	45915-012-04	Fuel Level Meter	1
10	46200-010-05	Push-Pull Switch	4
11	46200-003-75	Ignition Switch	1
12	46165-002-72	Circuit Breaker 30A	1
13	46165-001-41	Circuit Breaker 30A	3
14	46270-004-04	Socket, Panel Light	3
	46270-002-37	Bulb, Panel Light	3
15	46270-005-03	Socket, Gauge Light	4
	46270-001-36	Bulb, Gauge Light	4
16	46165-001-40	Circuit Breaker 10A	1
17	46165-004-79	Circuit Breaker 15A	3
18	46260-001-78	Bus Bar	1
	46260-001-10	Terminal Block	1
19	435-060	Screw, #6-32 x 9/16" Round Head NC	4
19	440-007	Nut, #6-32	4
	7438-021	Shakeproof, -6	4
	7435-076	Screw, -8-32 x 9/16" Round Head NC	10
20	7440-008	Nut, -8-32	10
	7438-022	Shakeproof, -8	10
21	7504-055	Screw, #8-32 x 3/4" Binding Head	8