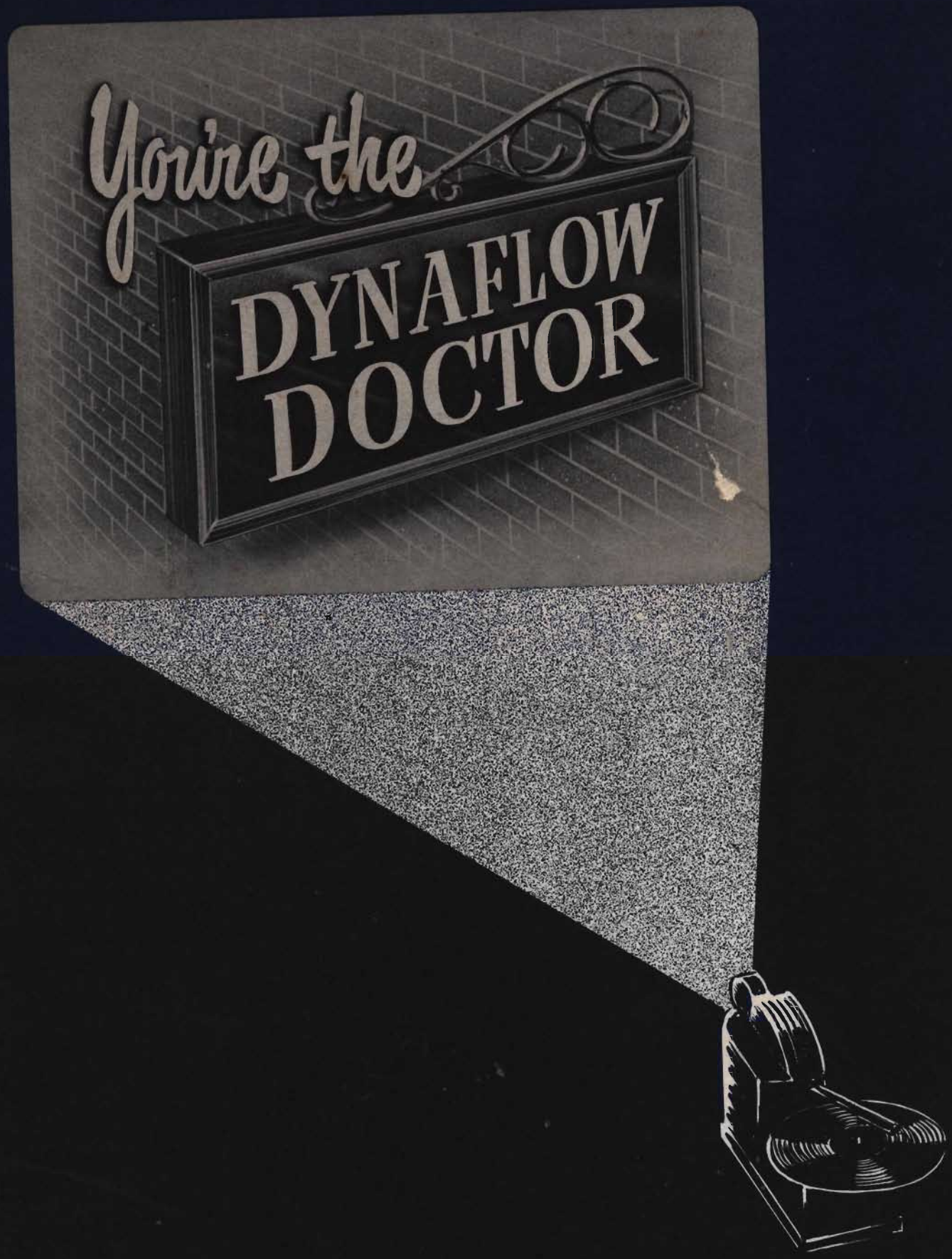
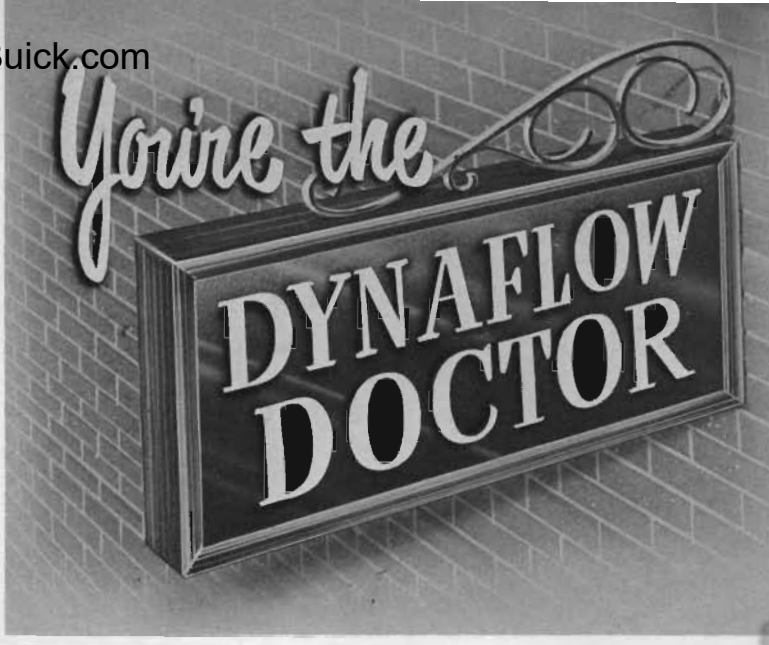


SERVICE DEPARTMENT • BUICK MOTOR DIVISION • GENERAL MOTORS CORPORATION

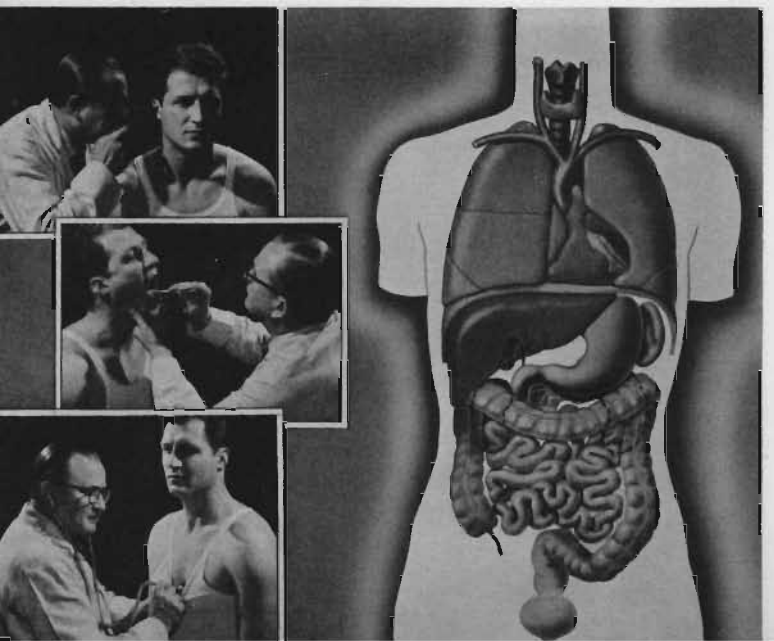


Have you ever stopped to think how a doctor goes about his job of diagnosing his patients' ills? Suppose we step in with this patient and see.

First, he listens to the patient's complaint. He asks questions. Where does it hurt? How long has the ache been present? This step gives him the first clues as to what the trouble may be.

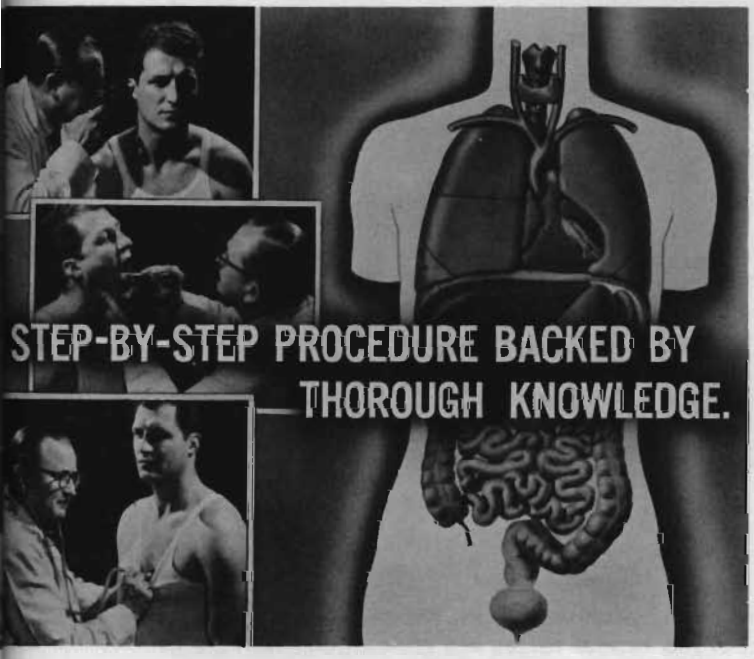
Next, the doctor checks the patient's blood pressure, pulse, temperature and other basic functions of the human body. These checks help him determine whether the various component parts of the body, like the heart, lungs, kidneys and so on are functioning properly.

For example, a temperature of a hundred and three degrees would indicate the presence of an infection in the body.



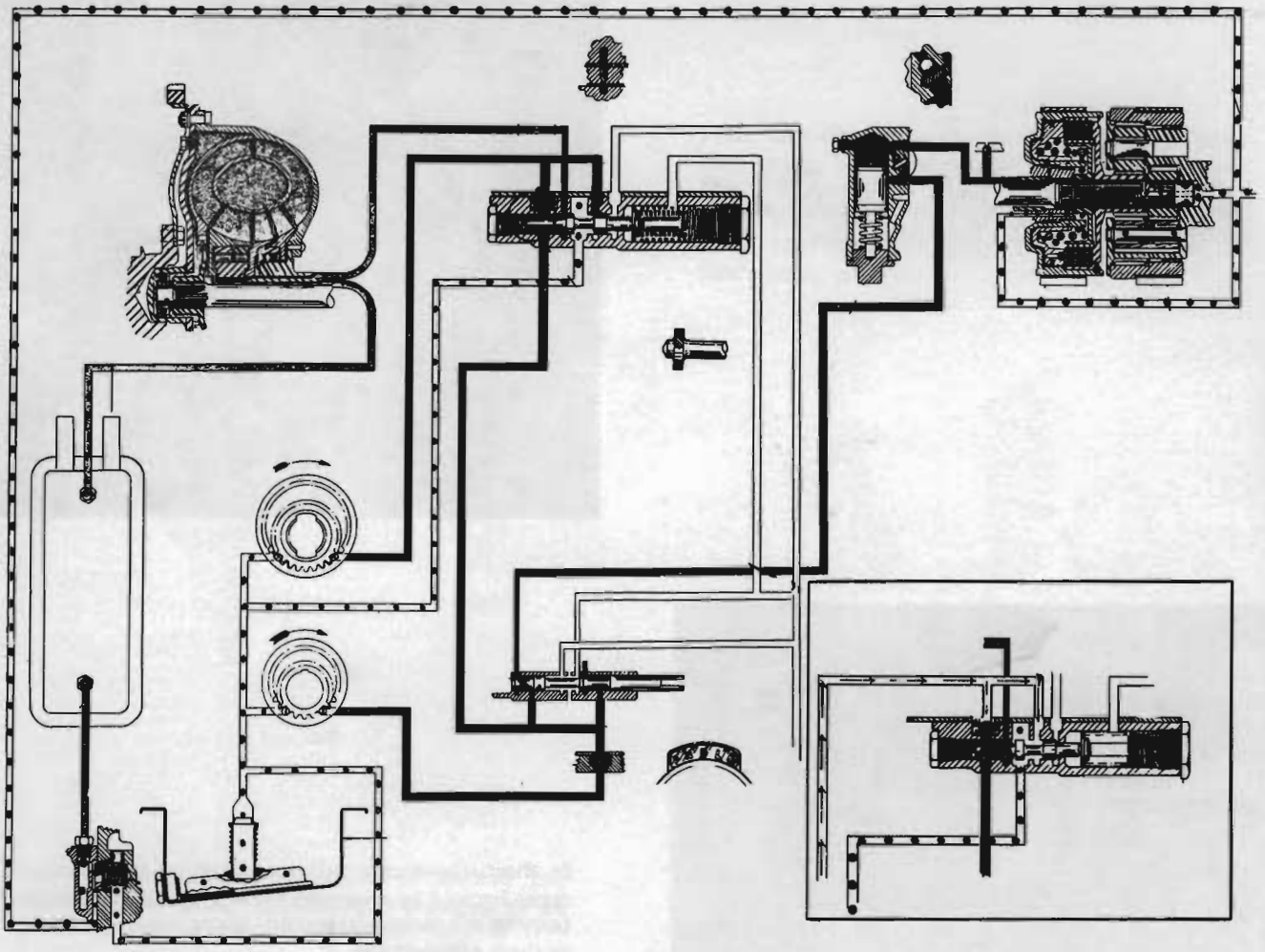
Using other checks and symptoms, as well as his thorough knowledge of the construction and operation of the body, the doctor can soon determine exactly what part of the body is infected. His knowledge of the inside makes diagnosis possible by checks made on the outside. He can then proceed with his remedy. In many cases, this simply requires medicine. In others –

– an operation may be necessary. There's no guesswork here. The doctor knows exactly where, inside the body, he will find the trouble.

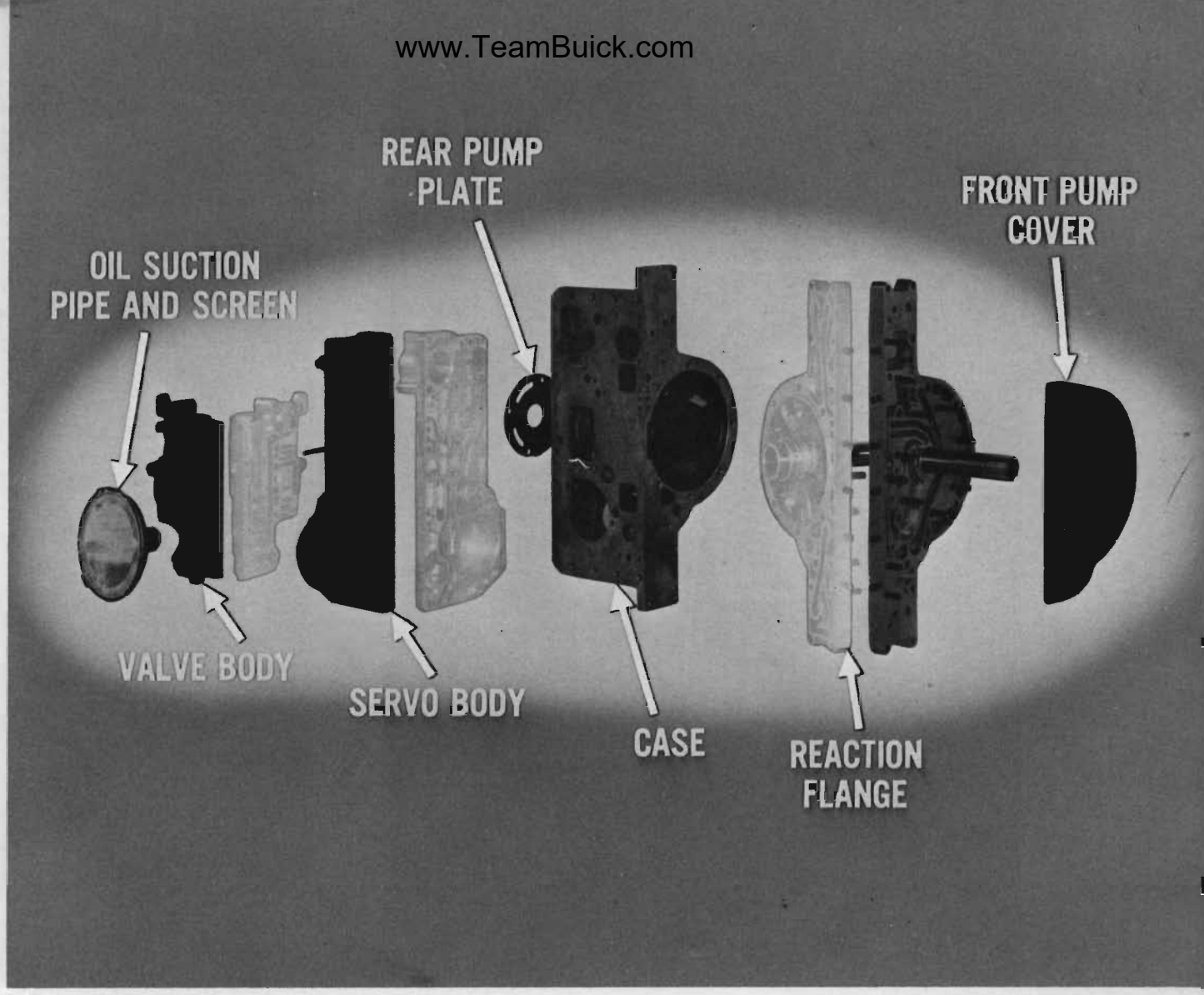


In short, the doctor follows a step-by-step procedure, backed by thorough knowledge of the human body to diagnose and remedy his patients' ailments to their satisfaction.

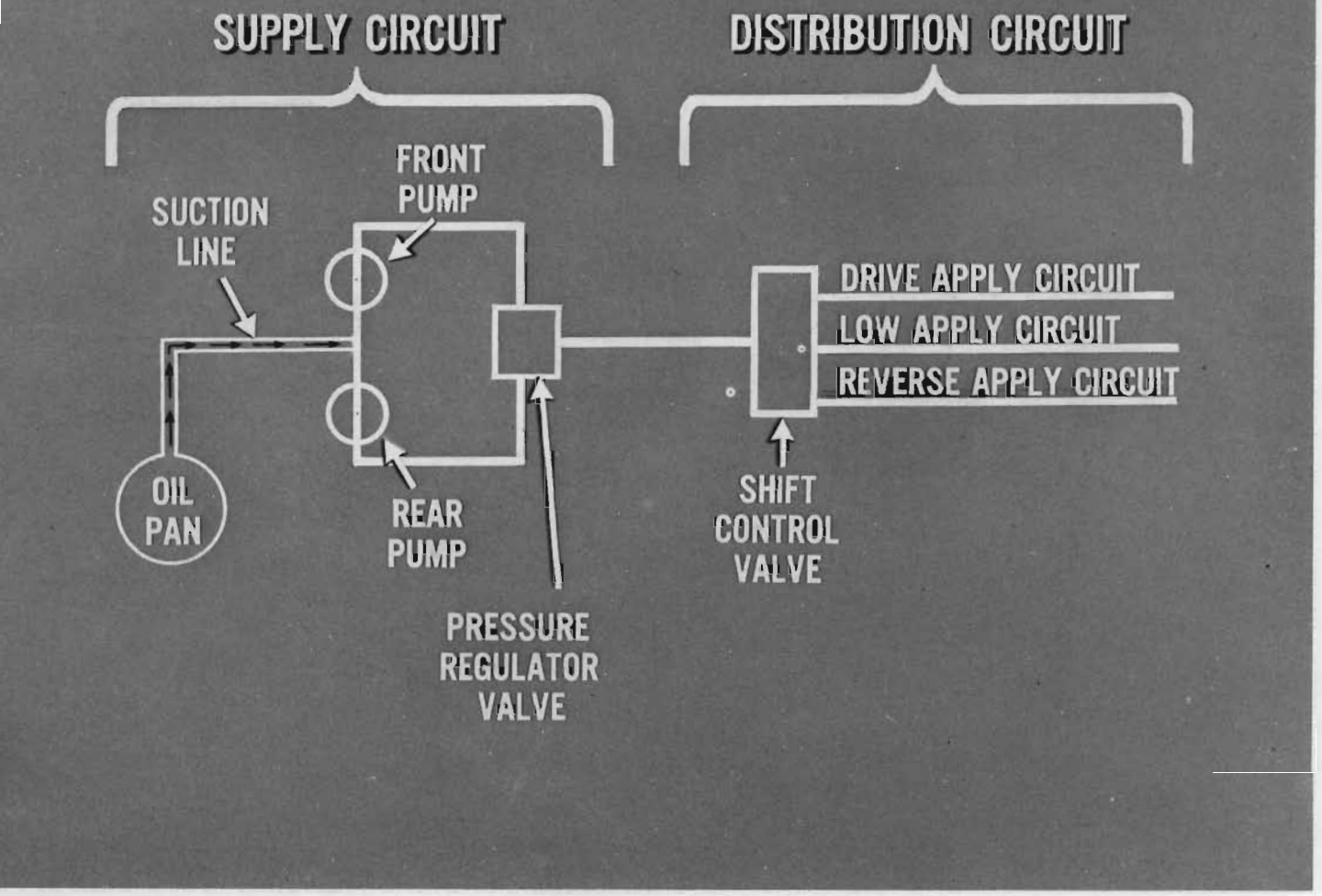
As qualified Buick Dynaflow mechanics, we are the doctors when it comes to Dynaflow ailments. We can raise our professional status, save time and money, and, at the same time, give our customers satisfaction by using the step-by-step procedure backed by thorough knowledge which all good doctors follow.



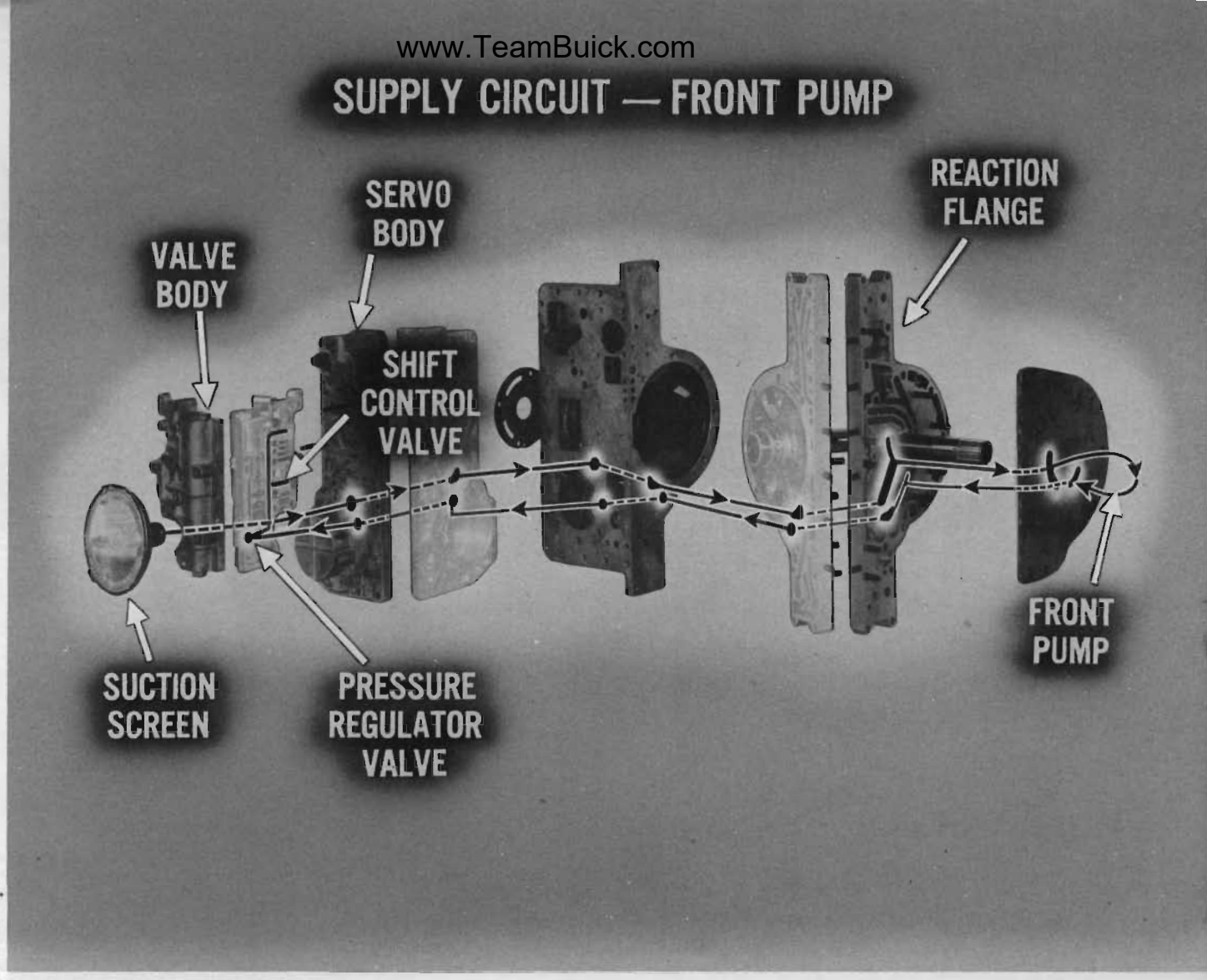
One of the most important parts of the Dynaflow transmission, is the hydraulic system. We are all familiar with the basic oil flow of the system, as well as with the operation of the various valves and pressure controls. But to make our diagnosis quicker and easier, a thorough understanding of the internal oil flow through the various parts is necessary. So let's get acquainted with it.



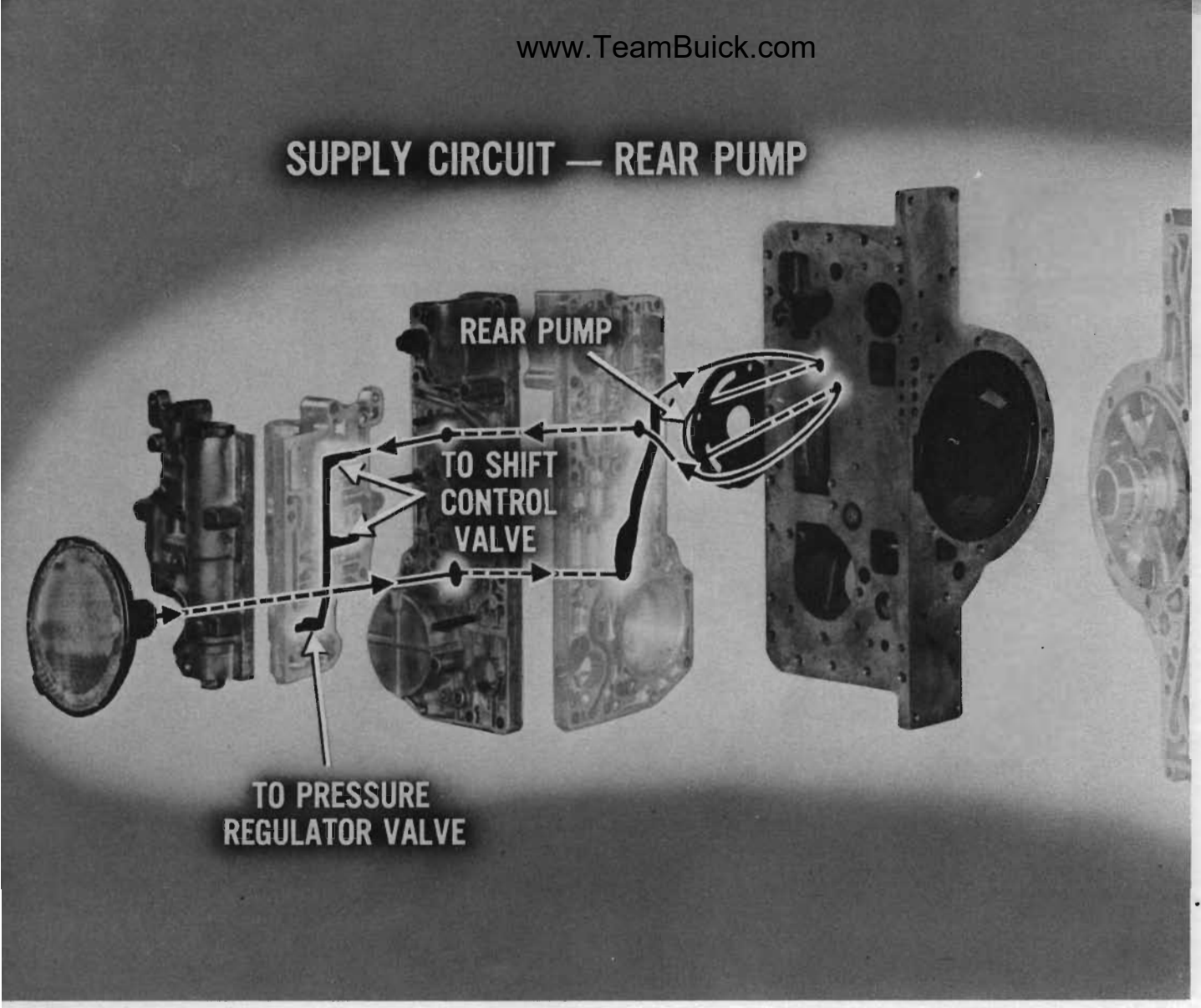
Here are the main parts through which oil flows under pressure. They are the oil suction pipe and screen, rear pump plate, front pump cover, valve body, servo body, case and reaction flange. We see them here in an exploded view especially designed so that both sides of the basic parts are visible. Before we see how the oil pressure flows through these parts, let's briefly review the two basic circuits of the hydraulic system.



As we know, the hydraulic system consists of two basic parts, the supply circuit and the distribution circuit. Oil is drawn from the oil pan by the front and rear pumps which put it out under pressure and deliver it through the pressure regulator valve and to the shift control valve, which, in turn, distributes it to the drive, low, and reverse circuits as desired. Now, let's see the path the supply circuit takes through the various parts.

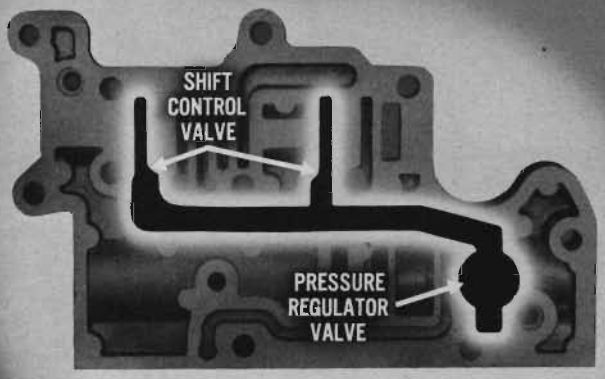


When the engine is running, the front pump draws oil from the oil pan, through the screen and suction pipe passing directly through the servo body and through the bottom of the transmission case. Then it passes through the reaction flange into a channel at the front of the flange which matches with an opening in the front pump cover. The front pump draws in the oil and pumps it out under pressure back through another opening in the front pump cover, into a channel in the reaction flange and then through it into the front side of the case, out through the bottom of the case, through the servo body and into the valve body, where it passes into the pressure regulator valve and shift control valve. This supply oil under pressure is common in all positions of the shift lever at all engine speeds below forty-five miles an hour or approximately twenty-five hundred revolutions per minute.



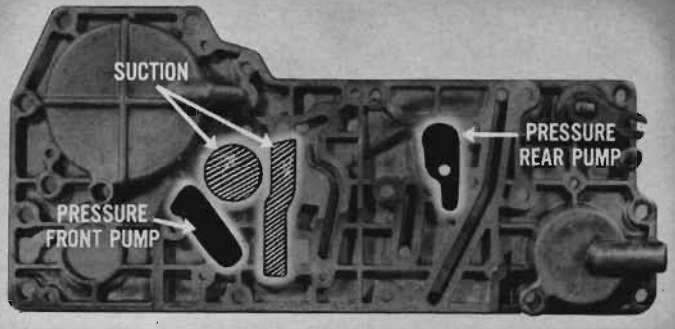
Here is the supply circuit when the rear pump is supplying the pressure, which is at speeds above forty-five miles an hour. The oil is drawn from the oil pan through the screen and suction pipe and through the servo body. Then it runs along a channel in the servo body and into the bottom of the case. The passage in the case directs it to the rear oil pump. From there it returns under pressure through another passage in the case, through the servo body and then into a channel in the valve body which directs it into the pressure regulator valve and shift control valve. Now let's get a closer look at the individual parts and see the supply circuit channels and passages.

VALVE BODY —
SUPPLY CIRCUIT



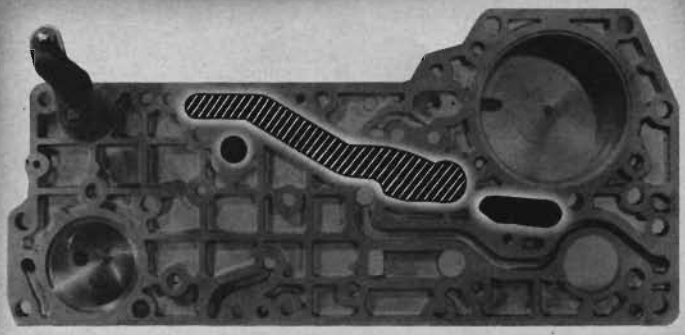
Here's the path the supply circuit takes in the valve body which directs oil under pressure to the pressure regulator valve and shift control valve. Now let's see the bottom of the servo body. The terms top and bottom, front and rear indicate the position of the part as installed in the car.

SERVO BODY — BOTTOM
SUCTION AND PRESSURE CHANNELS

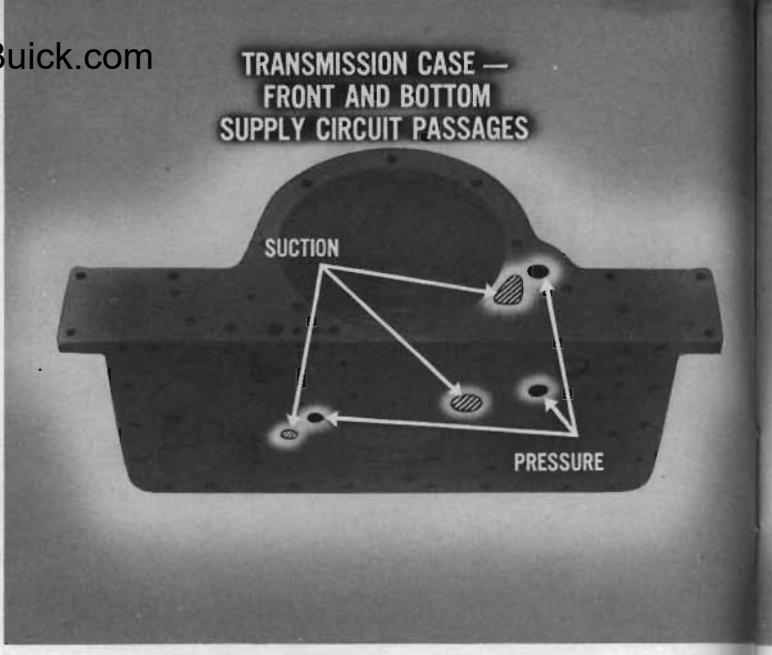


This is the bottom side of the servo body showing the suction and pressure channels, to and from both the front and rear pumps. Note that the suction channels are indicated by shaded areas while pressure channels are solid.

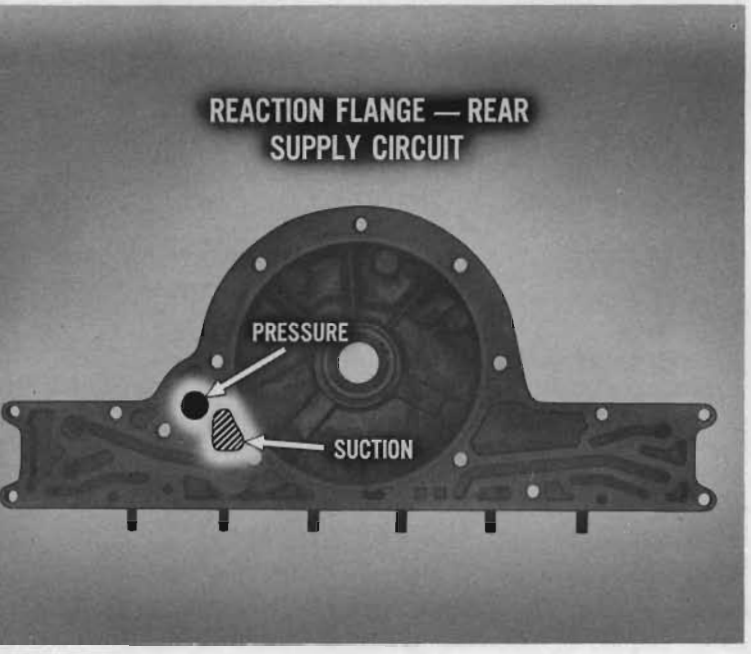
SERVO BODY—TOP
SUPPLY CIRCUIT
SUCTION AND PRESSURE FLOW



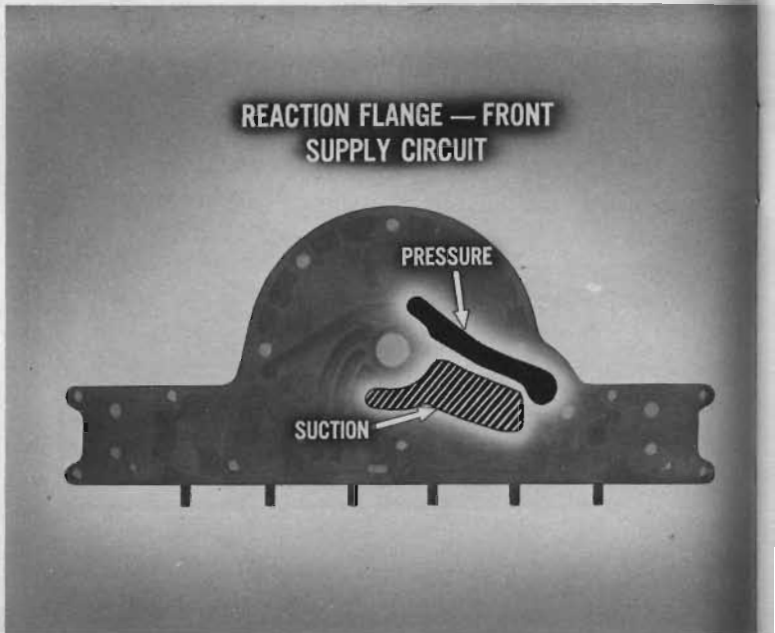
Here is the top side of the servo body showing the suction and pressure flow channels of the supply circuit.



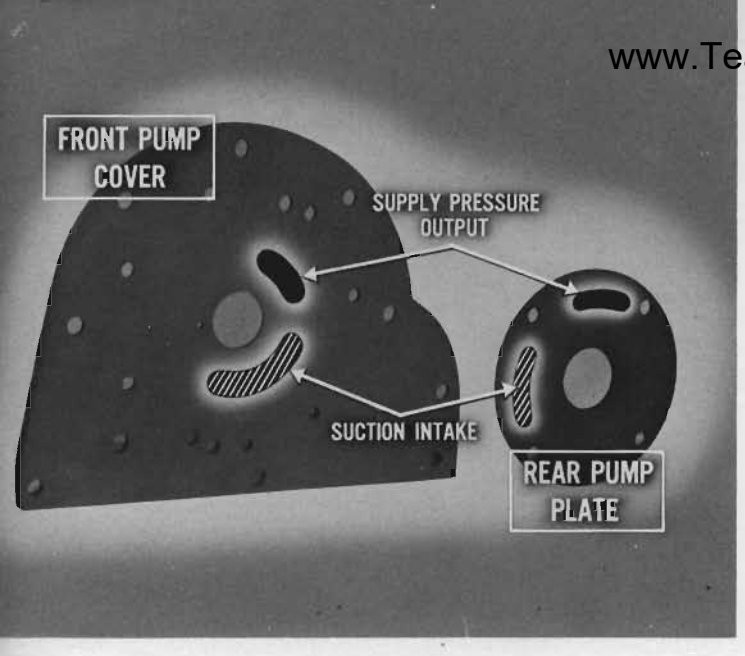
And here we see the suction and pressure passages of the supply circuit in the front and bottom of the case.



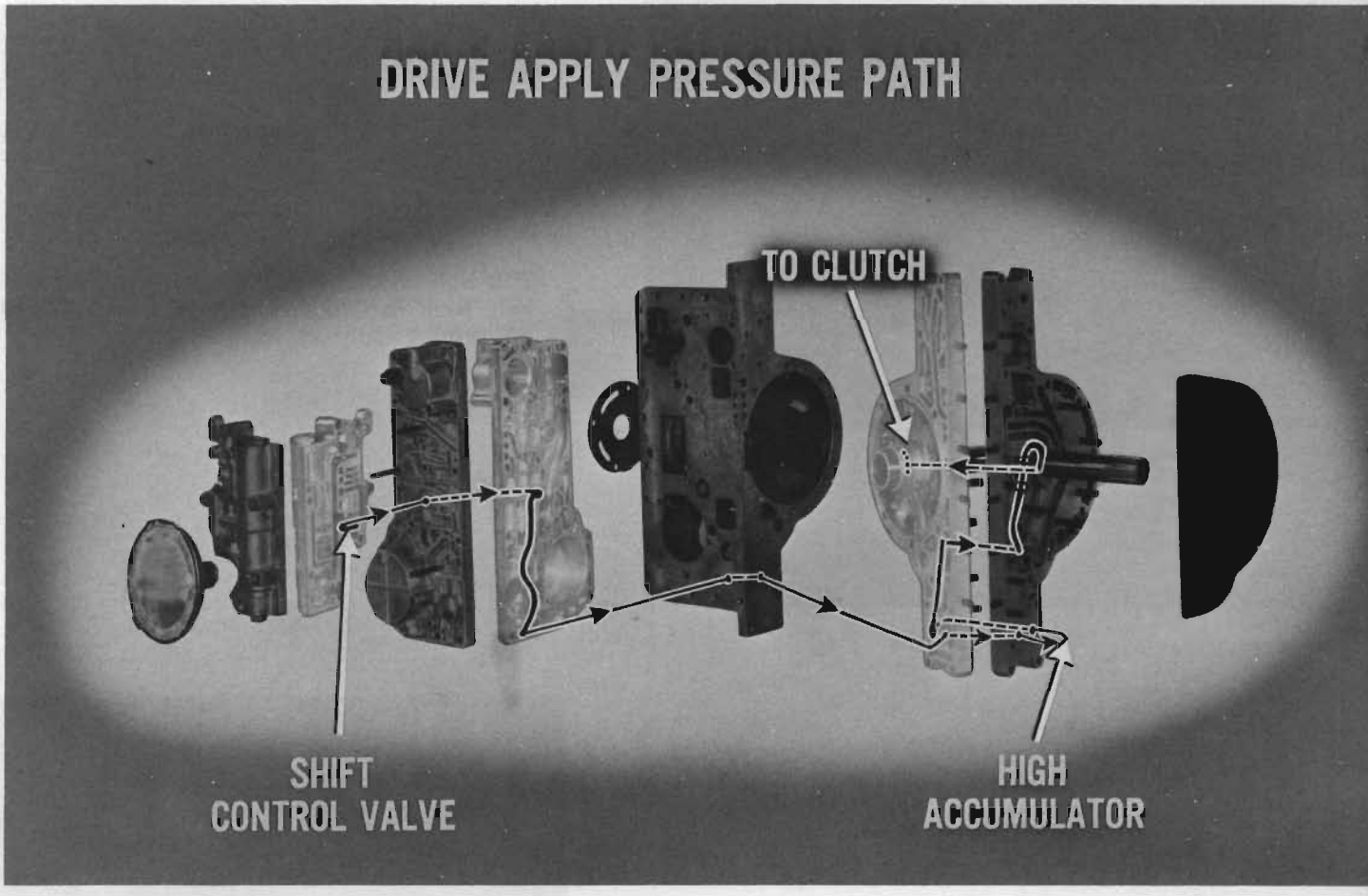
And here is the rear side of the reaction flange showing the suction and pressure passages of the supply circuit.



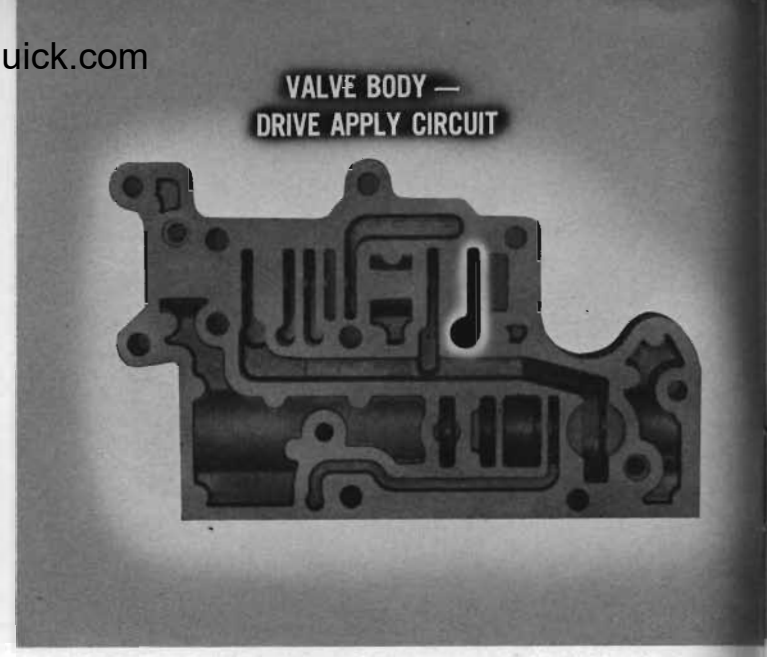
Here is the front side of the reaction flange showing the suction and pressure oil passages of the supply circuit.



Here are the front pump cover and the rear pump plate. The larger slot in each connects with the suction intake passage and the smaller is the pressure output side. This completes the supply circuit. Now, let's take up the distribution side of the hydraulic system.

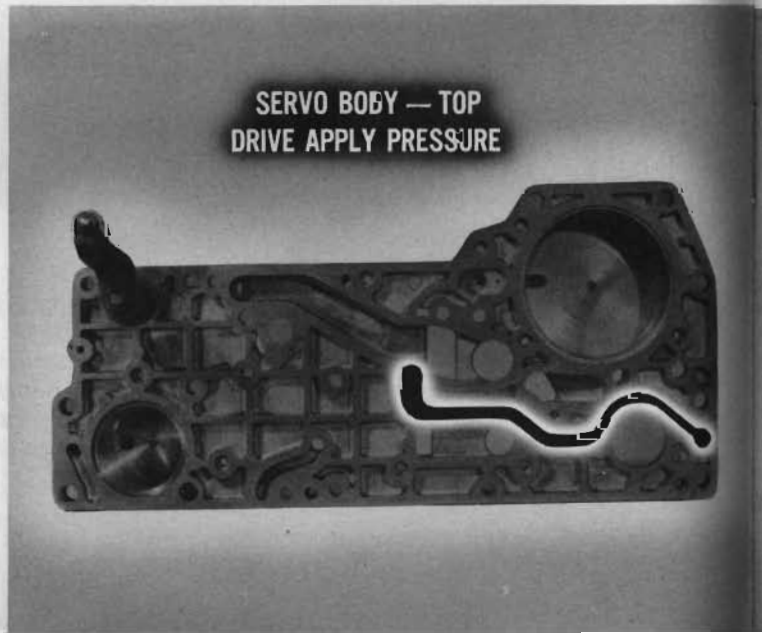


First, let's get acquainted with the drive apply pressure path. Starting at the shift control valve in the valve body, the pressure flows through the servo body, then in a channel on the top side of the servo body, through a passage in the case and then through the reaction flange and into the high accumulator. From there, the oil under pressure goes back through the reaction flange, through a channel in the back face of the flange and then back to the front of the flange. Now it flows through a channel at the front of the flange and into four holes near the shaft which direct it through the flange and into the clutch. Now let's get a closer look at drive position flow in each of these parts.



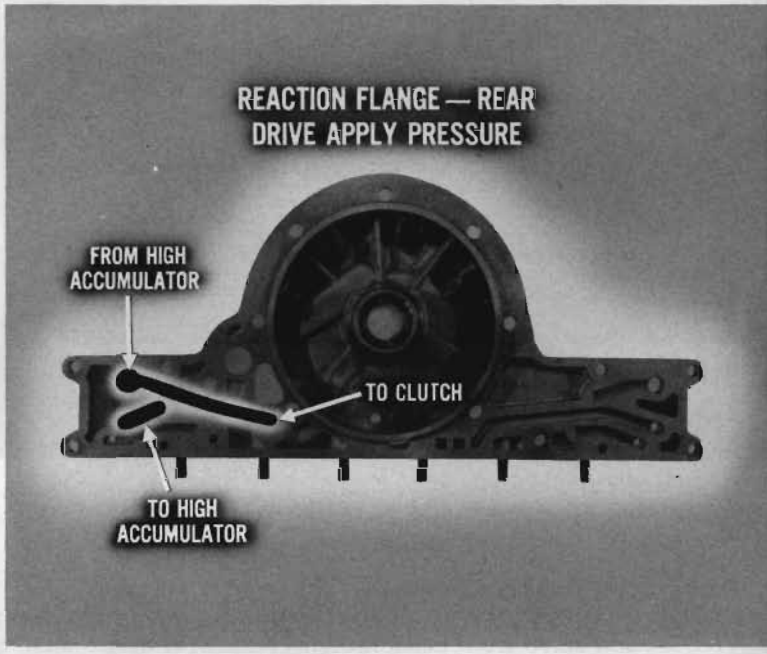
Here's where oil under pressure in the drive apply circuit leaves the valve body.

This hole in the bottom of the servo body is the only point on this side of the servo body through which drive apply pressure passes.

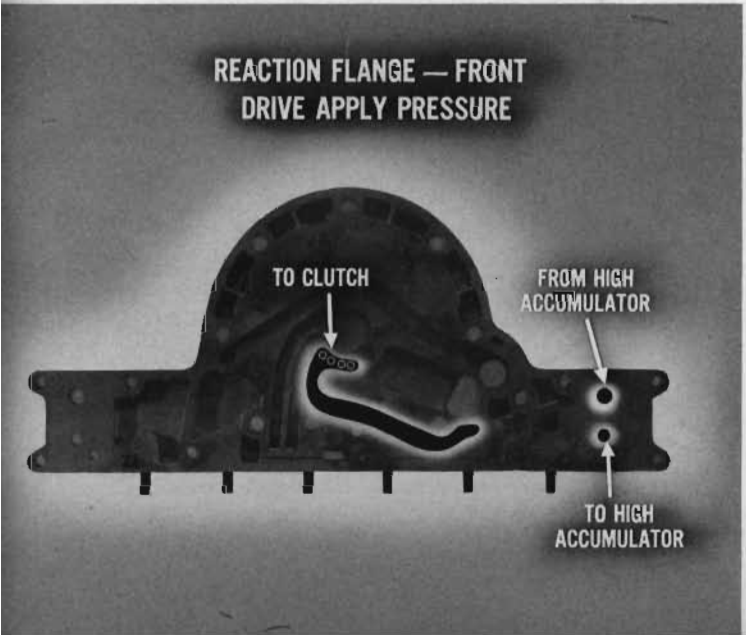


And here is where drive apply pressure is channeled on the top of the servo body.

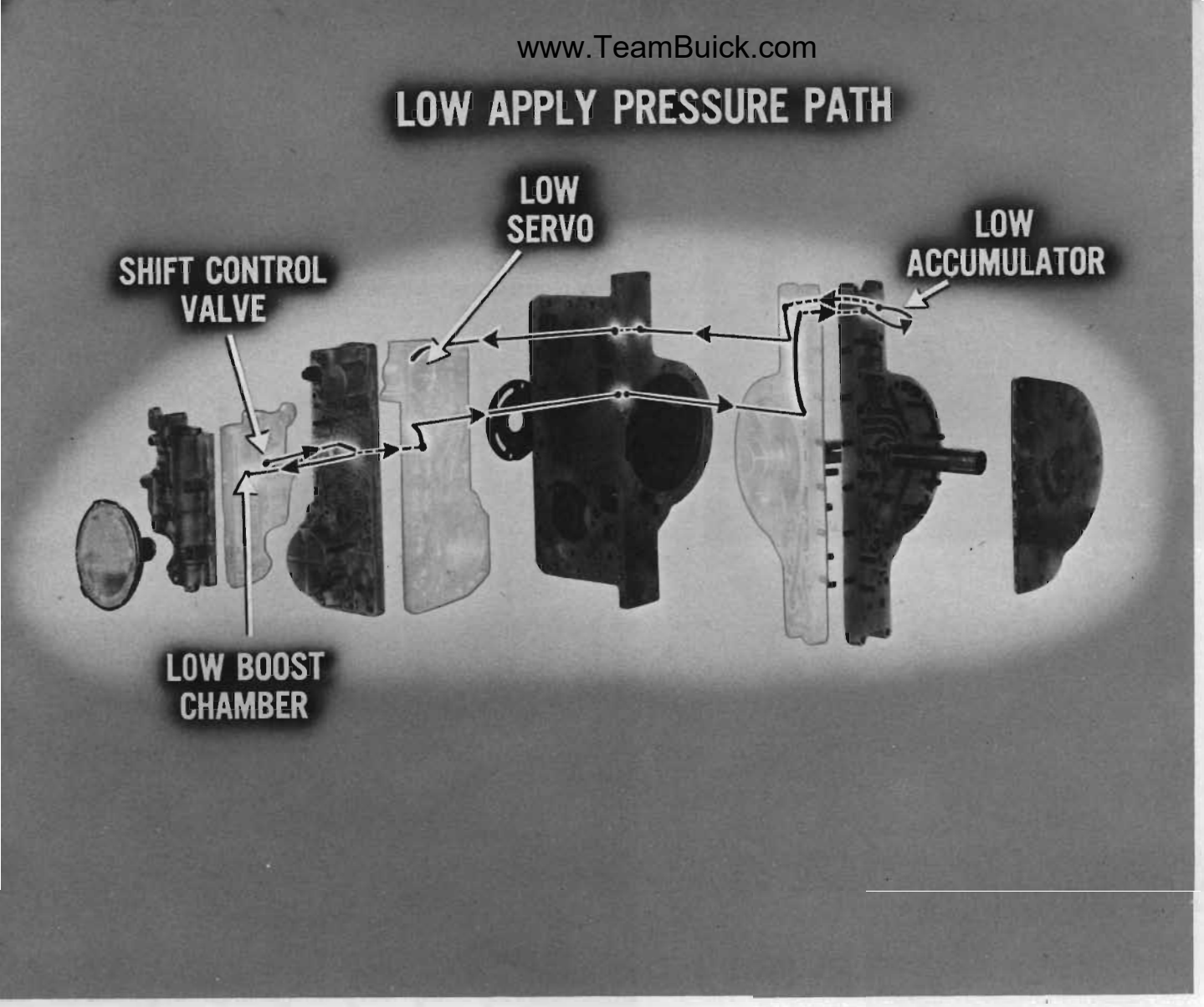
A passage in the bottom of the transmission case then routes the oil out the front side of the case.



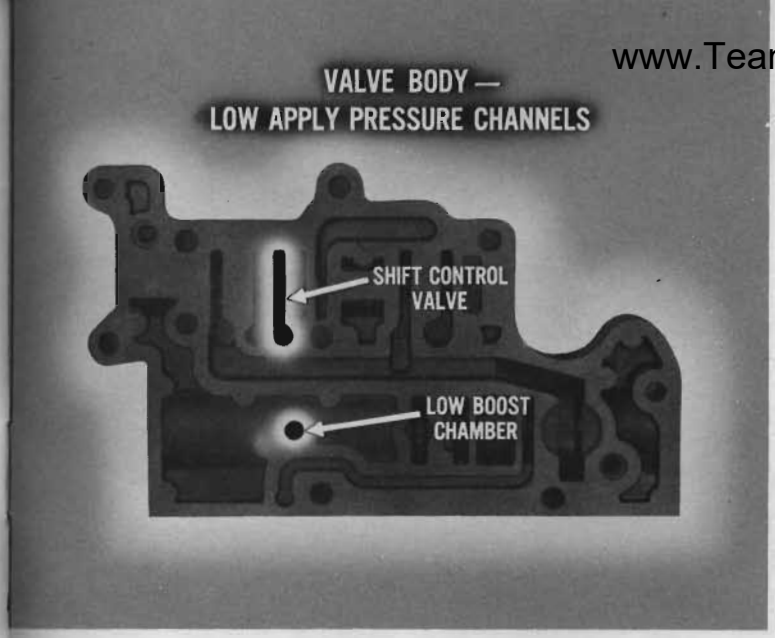
Here is the rear side of the reaction flange showing how the oil is channeled to and from the high accumulator and to the clutch in drive position.



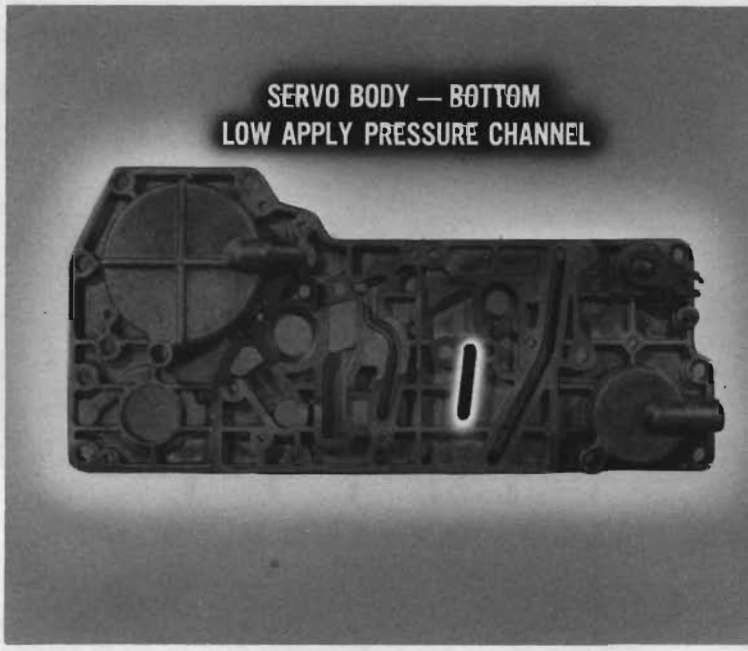
And this is the path the drive apply pressure takes on the front side of the reaction flange to and from the high accumulator and then to the clutch.



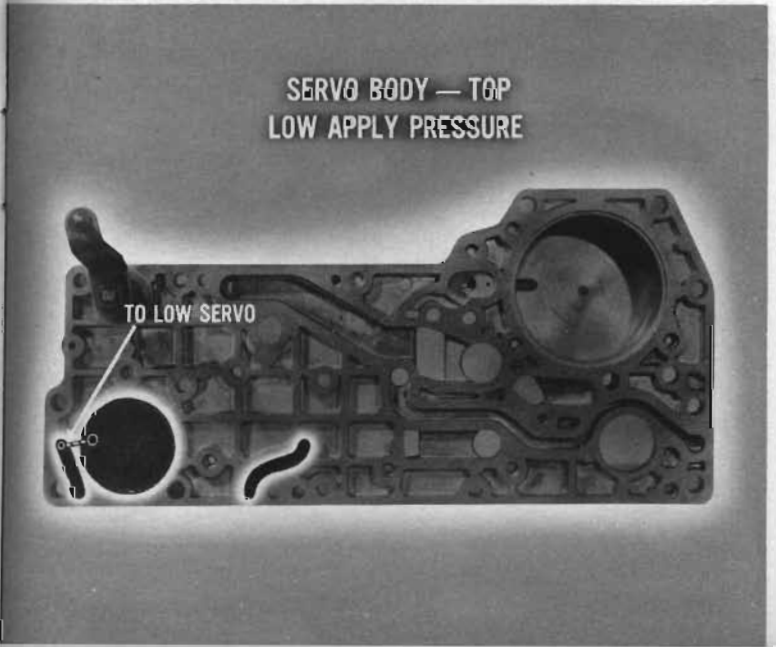
Now let's get acquainted with the path of low apply pressure. As we all know, the pressure used to apply the low servo is one hundred eighty pounds per square inch. So from the shift control valve the oil passes to a channel in the servo body. At this point it passes through the servo body and also back into the low boost chamber of the pressure regulator valve in the valve body. From the servo body, the oil at one hundred eighty pounds pressure is then routed through a passage in the bottom of the case, out the front side of the case, into a channel in the rear side of the reaction flange, along the flange and through the flange and into the low accumulator. From the low accumulator the oil under pressure then passes back through the flange, through the case and into the channel which feeds it under the low servo apply piston. Now, let's get a closer look.



Here is the valve body showing the low apply pressure in the shift control valve and the low boost chamber of the pressure regulator valve.

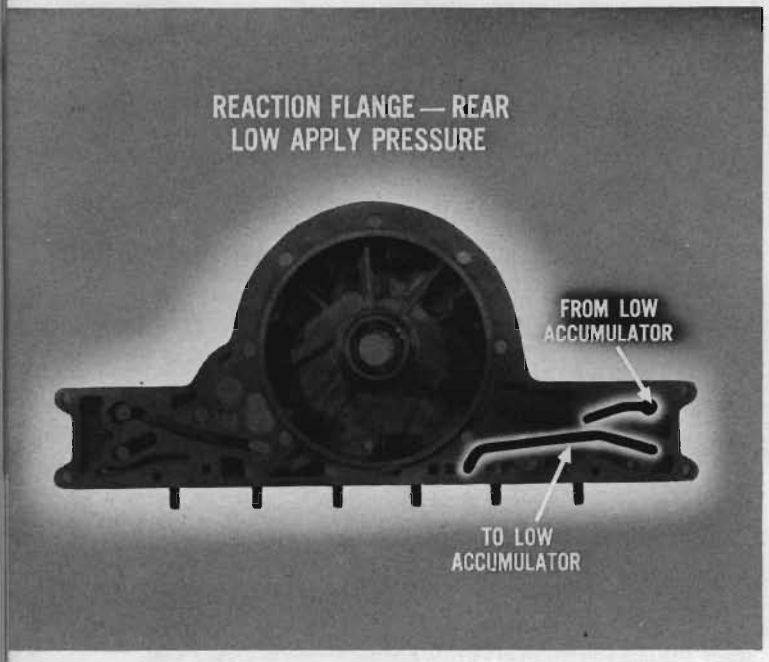


This small channel on the bottom side of the servo body directs the oil to the low boost chamber which permits the front oil pump to build up a pressure of one hundred eighty pounds for the low apply and also routes oil through the servo body.



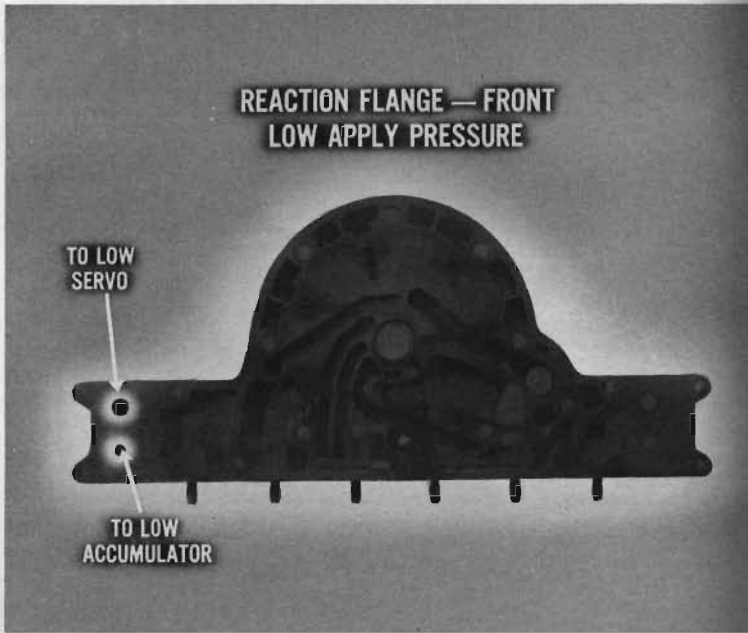
Here we see the path low apply pressure takes through the top of the servo body to operate the low servo.

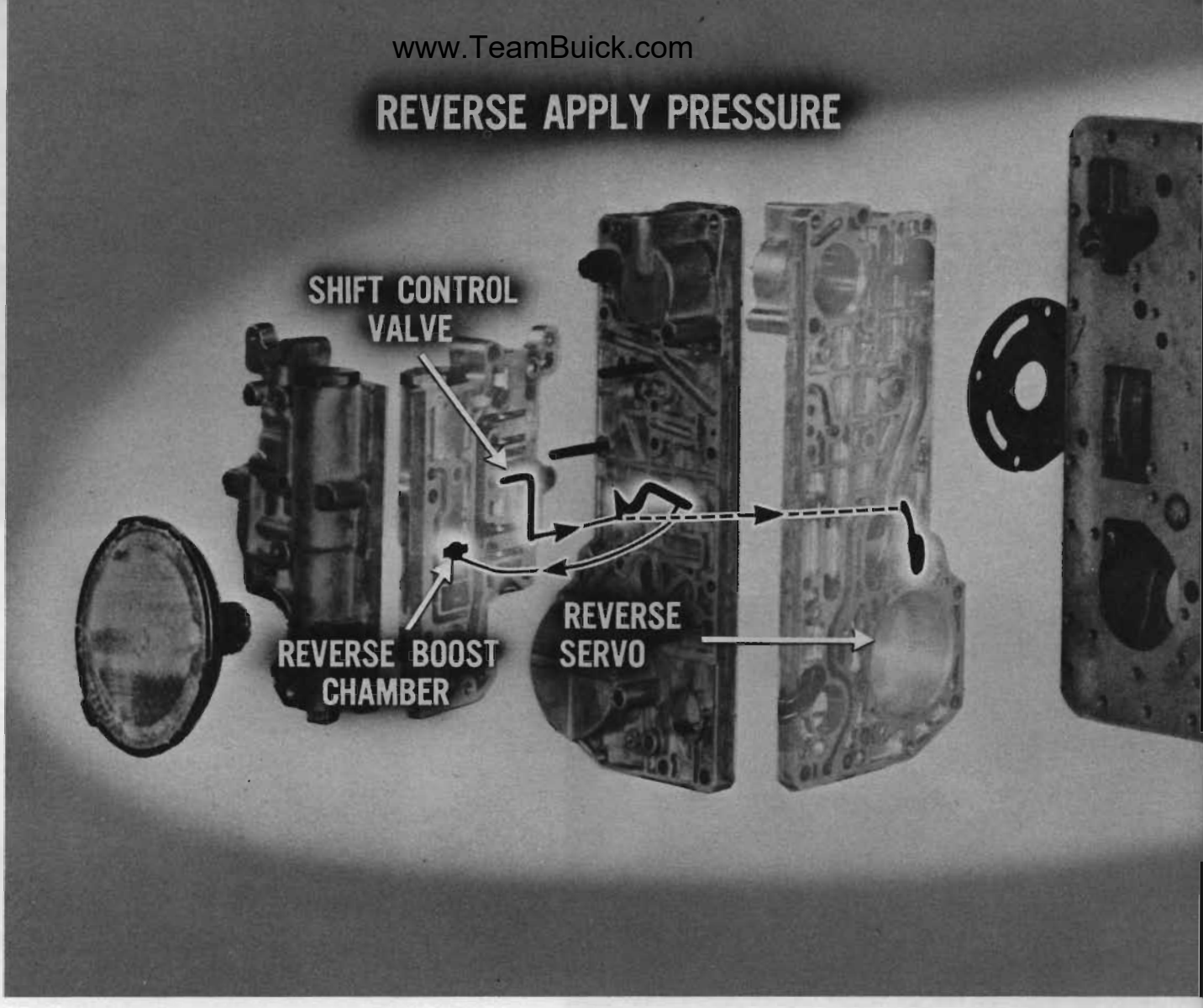
Here is the path the oil takes through the bottom and front of the transmission case on its way to the low accumulator and then back on its way to the low servo.



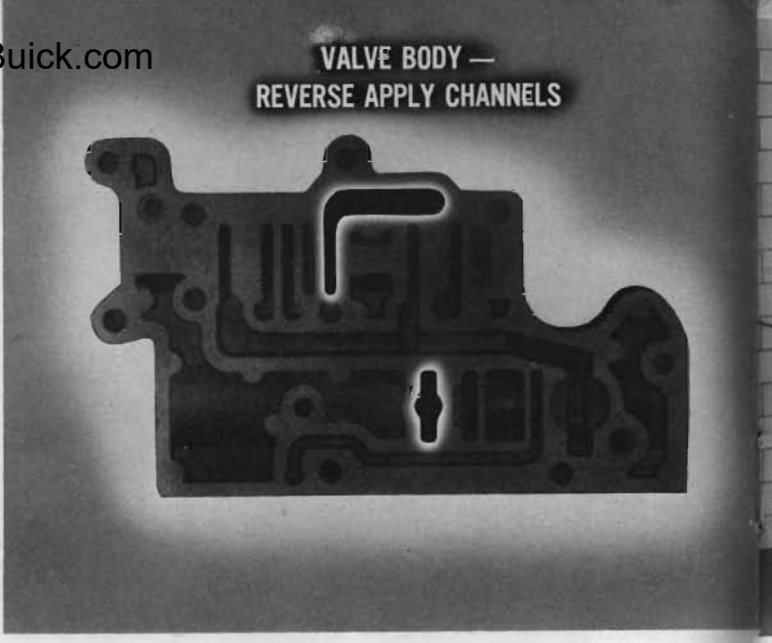
And here is how the channels in the back side of the reaction flange route the oil to and from the low accumulator.

These are the paths the low apply circuit takes at the front of the reaction flange to the low accumulator and back to the low servo. Now let's see the over-all path of oil in reverse range.

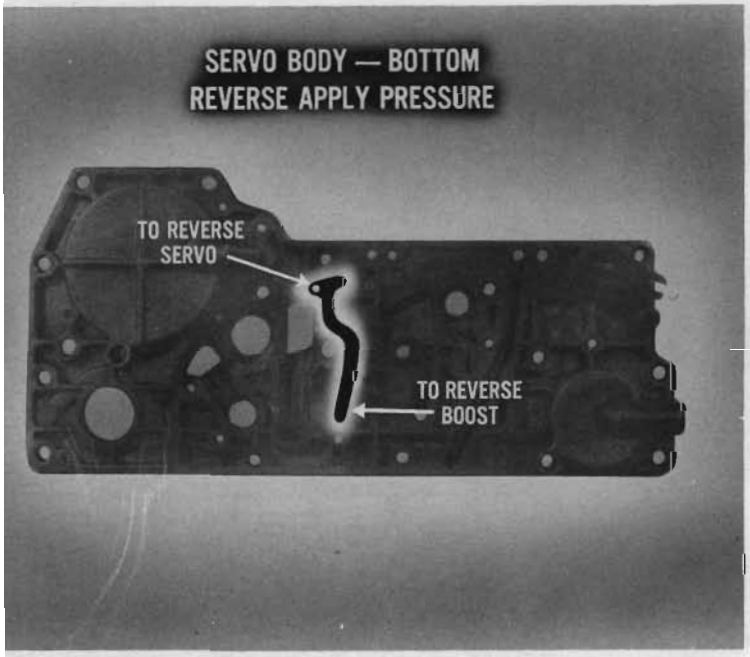




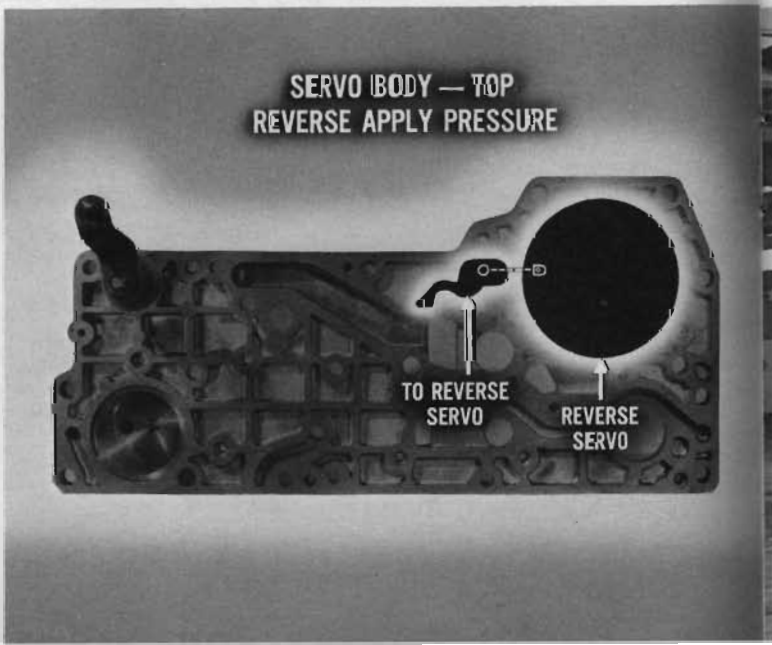
The path of reverse apply pressure is limited to the valve body and servo body. From the shift control valve the pressure is directed to the bottom of the servo body which channels it to the reverse boost chamber in the pressure regulator valve to permit the front pump to boost the pressure up to one hundred eighty pounds. Oil at the one hundred eighty pound pressure is then directed through the hole in the servo body and into the reverse servo.



Here is a closer look at the reverse apply pressure channels in the valve body.



Here's how the reverse apply pressure is directed by the bottom of the servo body to the reverse boost chamber and into the reverse servo line.



At the top of the servo body we see the path of oil as it is directed to operate the reverse servo piston.

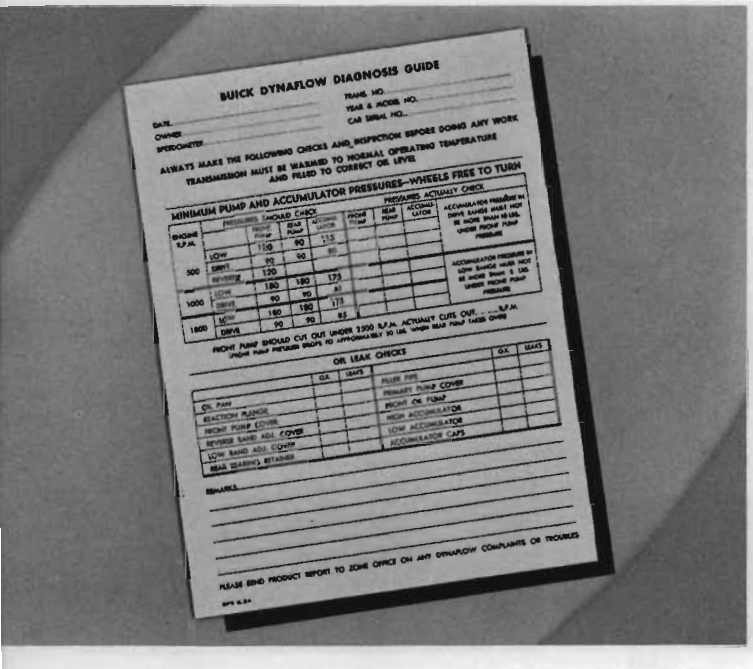
Now that we have an understanding of the internal pressure paths of Dynaflow, much the same knowledge that every doctor has of the human body, let's put the doctor's step-by-step procedure to work.

Here's a Buick owner telling the service advisor about his Dynaflow trouble. Following the doctor's step-by-step procedure, the service advisor listens to the owner's story and is ready to take notes. Then –

– he asks questions to make sure he gets all the information possible as to the symptoms. Under what conditions does the trouble show – cruising, heavy load, starting? How does it act in low, in reverse? After this the service advisor is ready to make –

– a road test of the system. He knows the feel of a properly operating transmission. The road test gives him a good check of the owner's story. It also provides additional clues as to the possible trouble.

The road test is a double check on the owner's story. Once you as the mechanic get the story from the service advisor you are ready to make your professional diagnosis.



BUICK DYNAFLOW DIAGNOSIS GUIDE

DATE
OWNER
SPEEDOMETER

TRANS. NO.
YEAR & MODEL NO.
CAR SERIAL NO.

ALWAYS MAKE THE FOLLOWING CHECKS AND INSPECTION BEFORE DOING ANY WORK

TRANSMISSION MUST BE WARMED TO NORMAL OPERATING TEMPERATURE AND FILLED TO CORRECT OIL LEVEL

MINIMUM PUMP AND ACCUMULATOR PRESSURES—WHEELS FREE TO TURN

ENGINE R.P.M.		PRESSURES SHOULD CHECK: FRONT PUMP	REAR PUMP	ACCUMULATOR	FRONT PUMP	PRESSURES ACTUALLY CHECK: REAR PUMP	ACCUMULATOR
500	LOW	110	90	115			
	DRIVE	120					
1000	REVERSE	180	180	175			
	LOW	90	90	85			
	DRIVE	90	180	175			
1800	NEW	180	90	85			
	DRIVE	90	90				

ACCUMULATOR PRESSURE IN DRIVE RANGE SHALL NOT BE MORE THAN 10 LBS. UNDER FRONT PUMP PRESSURE.

ACCUMULATOR PRESSURE IN LOW RANGE SHALL NOT BE MORE THAN 5 LBS. UNDER FRONT PUMP PRESSURE.

FRONT PUMP SHOULD CUT OUT UNDER 2300 R.P.M. ACTUALLY CUTS OUT _____ R.P.M.

ENGINE PUMP PRESSURE DROPS TO APPROXIMATELY 80 LBS. WHEN REAR PUMP TAKES OVER.

OIL LEAK CHECKS

	O.K.	LEAKS		O.K.	LEAKS
OIL PAN			PULLEY TYPE		
REACTION PLUNGE			PRIMARY PUMP COVER		
FRONT PUMP COVER			FRONT OIL PUMP		
REVERSE BAND ADJ. COVER			HIGH ACCUMULATOR		
LOW BAND ADJ. COVER			LOW ACCUMULATOR		
REAR BEARING RETAINER			ACCUMULATOR CAPS		

REMARKS

PLEASE SEND PRODUCT REPORT TO ZONE OFFICE ON ANY DYNAFLOW COMPLAINTS OR TROUBLES

First, make the pressure checks and write them on the Dynaflow Diagnosis Guide. This is your check on the internal operation of the hydraulic system.

With the transmission filled to the proper level, and warmed to normal operating temperature and with the wheels free to turn, make the pressure checks as listed on the Diagnosis Guide. By comparing them with pressures known to be normal, you can easily determine which pressure circuit is causing the trouble. Let's see a couple of examples.

THE FOLLOWING CHECKS AND INSPECTION
SSION MUST BE WARMED TO NORMAL OPERATING TEMPERATURE
AND FILLED TO CORRECT OIL LEVEL

UMP AND ACCUMULATOR PRESSURES—WHEELS FREE TO TURN

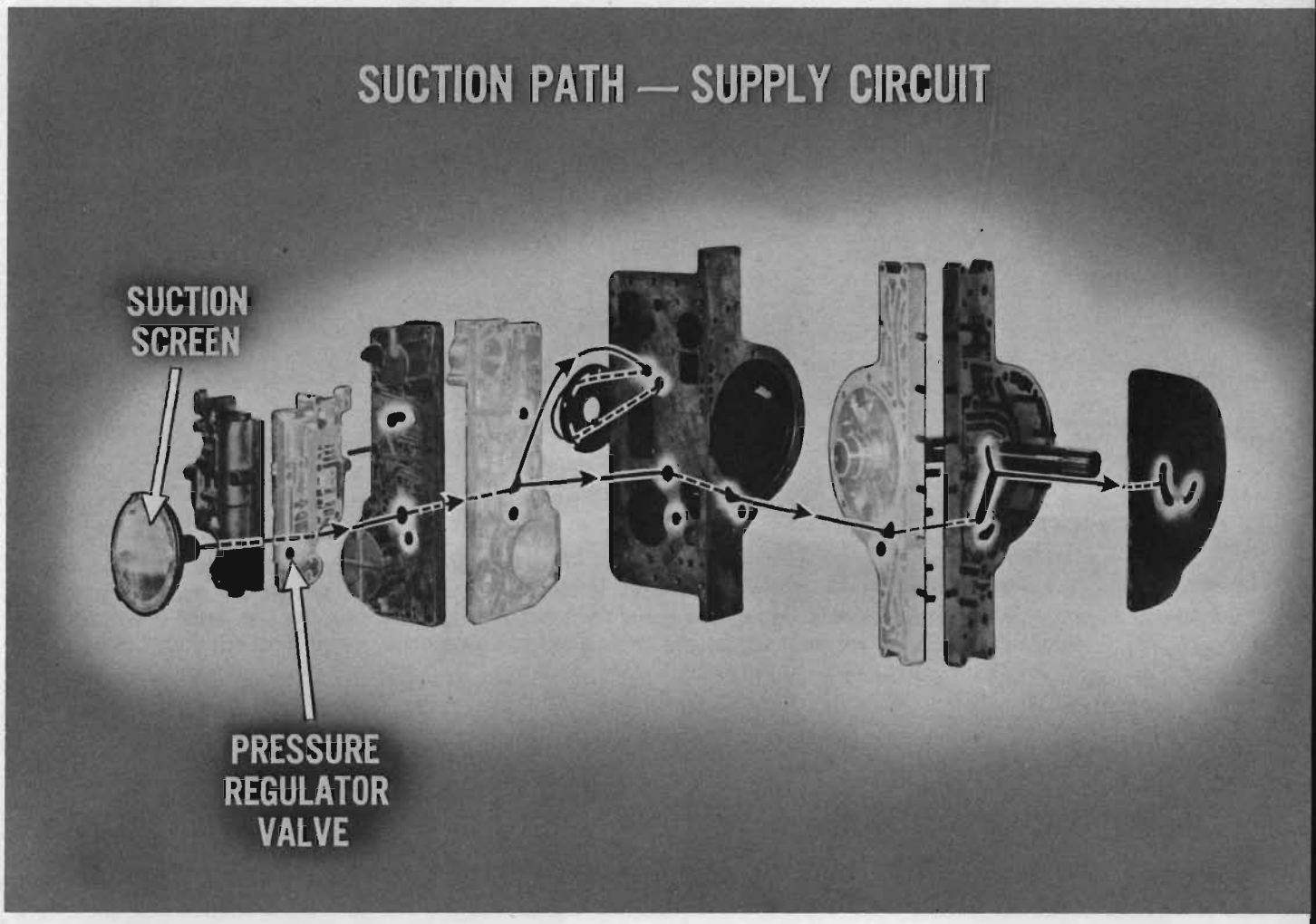
RESSURES SHOULD CHECK			PRESSURES ACTUALLY CHECK			
FRONT PUMP	REAR PUMP	ACCUMULATOR	FRONT PUMP	REAR PUMP	ACCUMULATOR	
120	90	115	90	60		ACCUMULATOR PRESSURE IN DRIVE RANGE MUST NOT BE MORE THAN 10 LBS. UNDER FRONT PUMP PRESSURE
90	90	80	60	60		
120			90			
180	180	175	150	150		ACCUMULATOR PRESSURE IN LOW RANGE MUST NOT BE MORE THAN 5 LBS. UNDER FRONT PUMP PRESSURE
90	90	85	60	60		
180	180	175	150	150		
90	90	85	60	60		

PUMP SHOULD CUT OUT UNDER 2500 R.P.M. ACTUALLY CUTS OUT_____R.P.M.
RONT PUMP PRESSURE DROPS TO APPROXIMATELY 20 LBS. WHEN REAR PUMP TAKES OVER)

OIL LEAK CHECKS

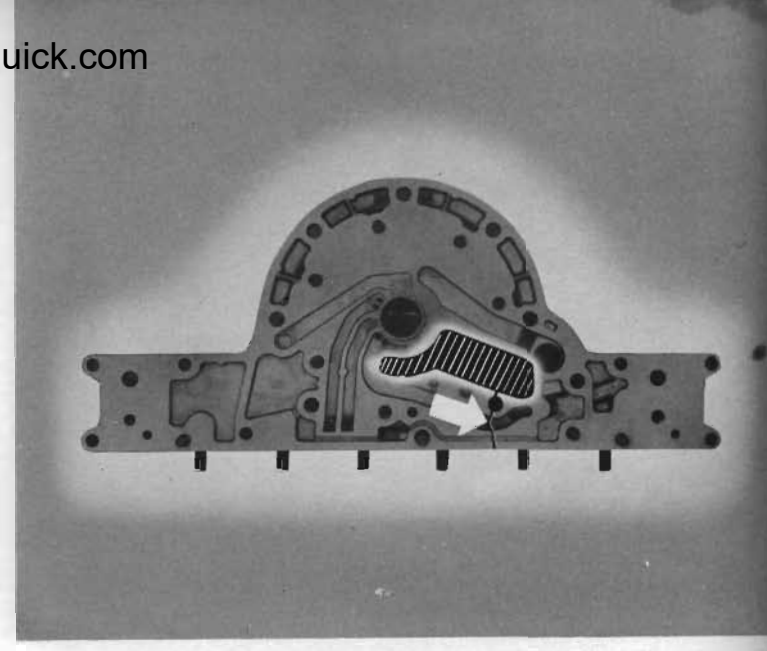
	O.K.	LEAKS
FILLER PIPE		
PRIMARY PUMP COVER		

Here's the first one. Both front and rear pump pressures are far below what they should be. Your knowledge of the internal pressure channels will help you put your finger on the trouble.



Since both pump pressures are low, chances are that the trouble is in the suction path. A clogged suction screen may be preventing enough oil from reaching the pumps. If the screen is okay, perhaps the pressure regulator valve is not functioning properly. Dirt may be holding the valve slightly or the valve spring may be weak or the valve body may be warped. Gasket leaks along the suction path may allow air to leak in and prevent the pumps from building up proper pressures.

A close inspection of the gaskets and each part along the suction path may reveal the air leaks. Now let's take up another possible trouble in the supply system.



NER
EDOMETER

WAYS MAKE THE FOLLOWING CHECKS AND INSPECTION BEFORE DOIN
TRANSMISSION MUST BE WARMED TO NORMAL OPERATING TEMPE
AND FILLED TO CORRECT OIL LEVEL

MINIMUM PUMP AND ACCUMULATOR PRESSURES—WHEELS FR

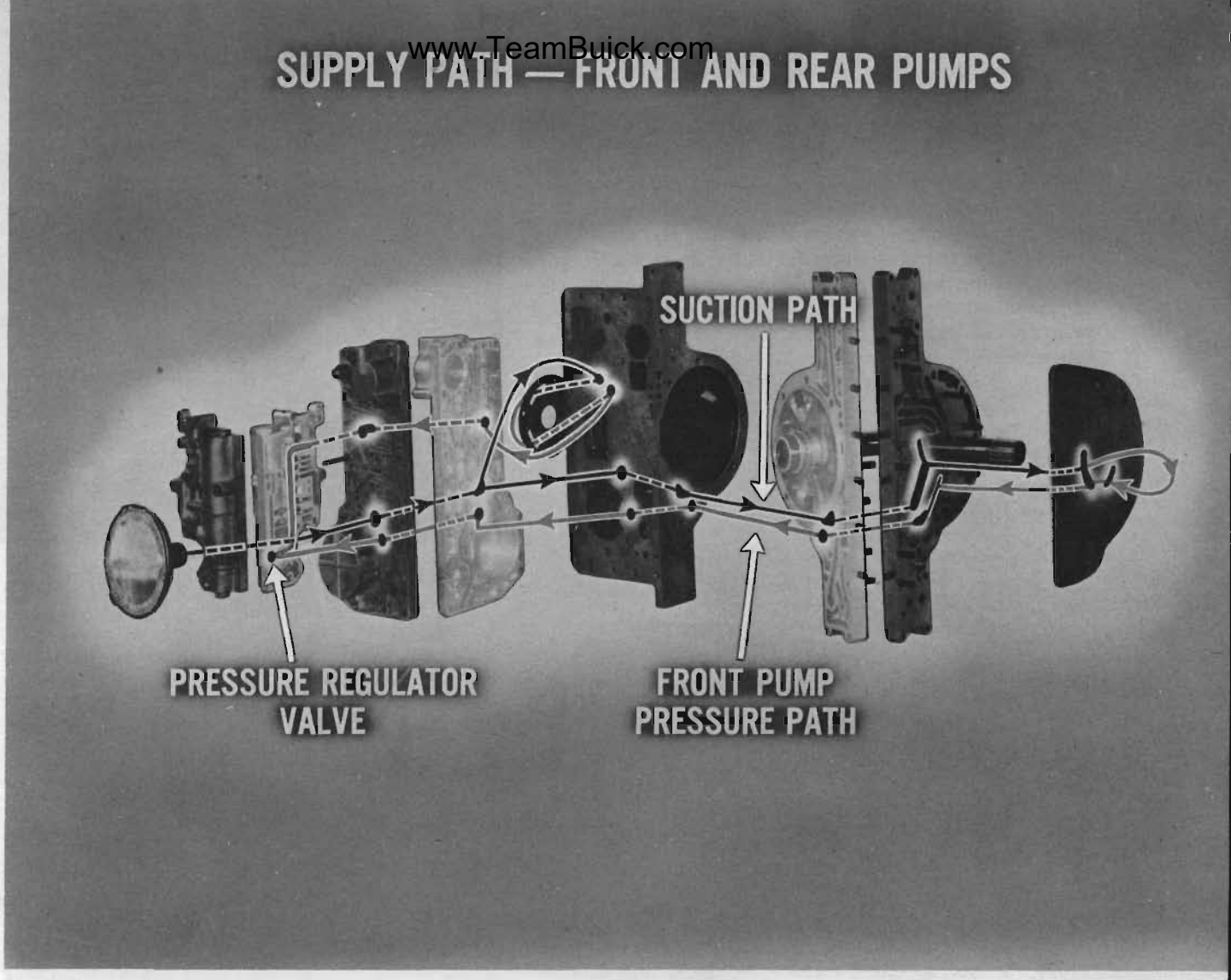
ENGINE R.P.M.		PRESSURES SHOULD CHECK			PRESSURES ACTUALLY C		
		FRONT PUMP	REAR PUMP	ACCUMU-LATOR	FRONT PUMP	REAR PUMP	ACCUMU-LATOR
500	LOW	120	90	115	90	90	
	DRIVE	90	90	80	60	90	
	REVERSE	120			90		
1000	LOW	180	180	175	150	180	
	DRIVE	90	90	85	60	90	
1800	LOW	180	180	175	150	180	
	DRIVE	90	90	85	60	90	

FRONT PUMP SHOULD CUT OUT UNDER 2500 R.P.M. ACTUALLY CUTS OU
(FRONT PUMP PRESSURE DROPS TO APPROXIMATELY 20 LBS. WHEN REAR PUMP T

OIL LEAK CHECKS

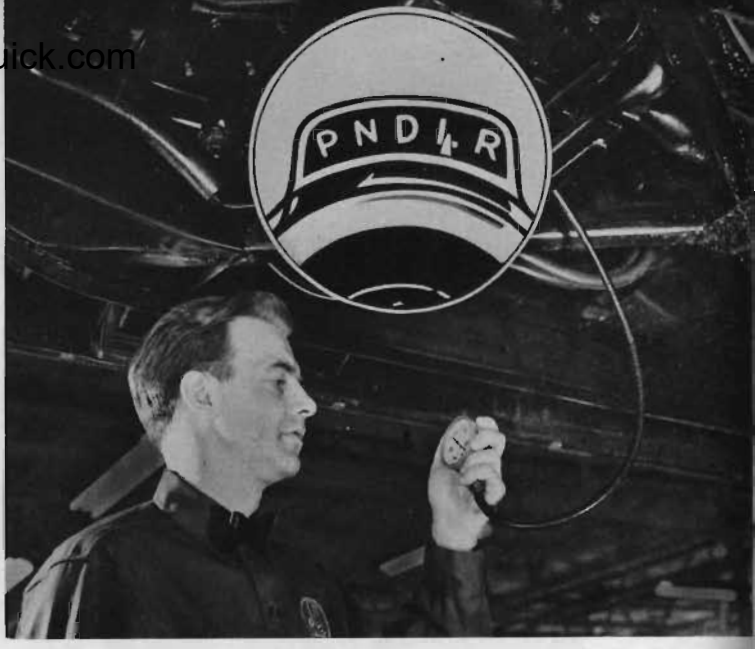
LEAKS

Here's a case where the rear pump pressure is okay but the front pump pressure is low. Let's look at the supply path of both pumps and determine the possible trouble.



As we can see here, both pumps use the same suction line and the same pressure regulator valve. So, since the rear pump pressure is okay the suction line and regulator valve must be okay. Chances are that the trouble is in the front pump itself or a pressure leak between the front pump and the pressure regulator valve. To track down the trouble, check the front pump clearances and the gaskets around the front pump pressure channels.

Low front pump pressure might also be caused by the rear pump check valve not seating properly. If the front pump pressure is low and the rear pump check valve is suspected, take a pressure check on the rear pump while in low range and the rear wheels locked. If you get a pressure reading, the rear pump check valve is not seating properly.



OWING CHECKS AND INSPECTI...

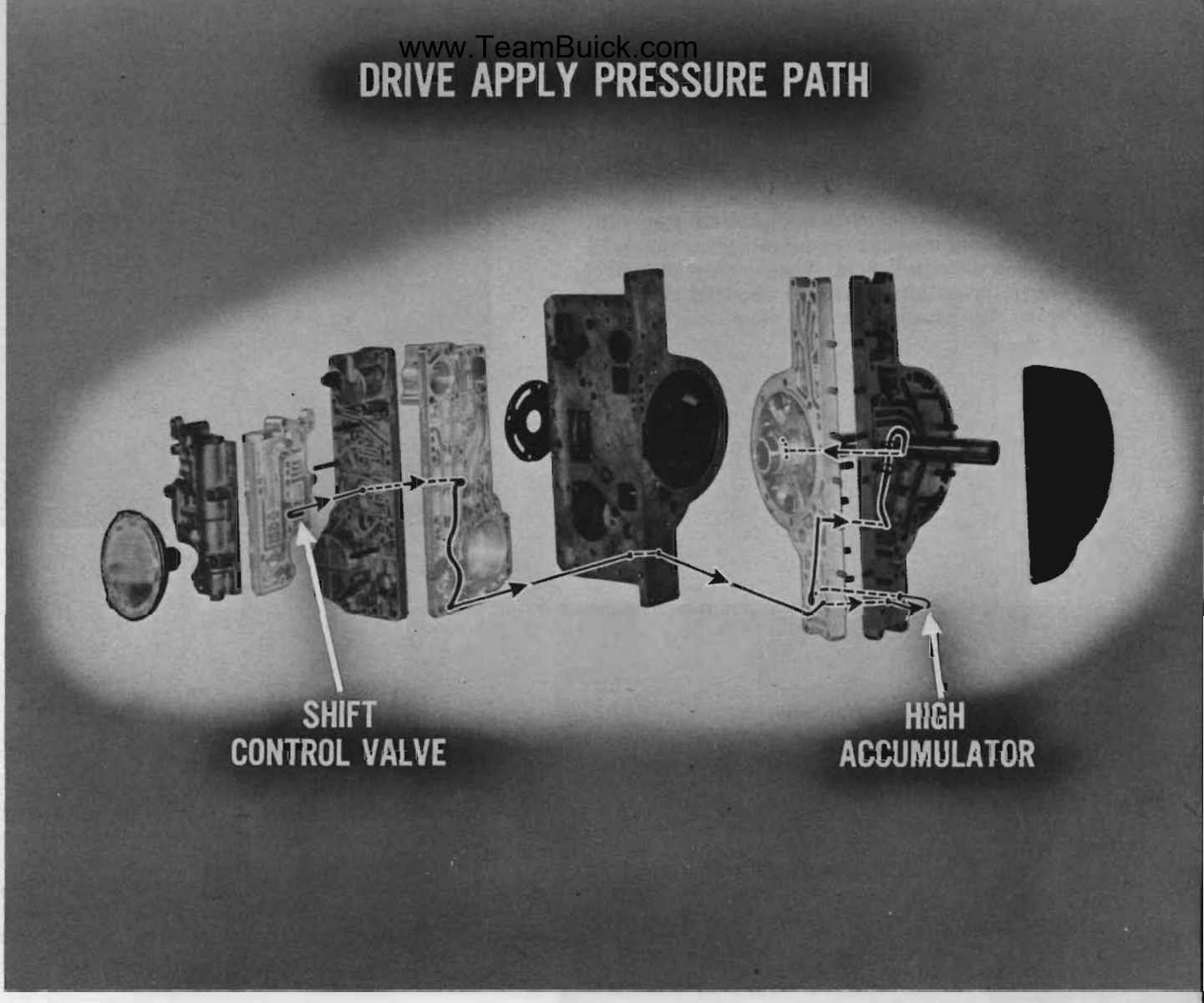
ST BE WARMED TO NORMAL OPERATING TEMPERATURE
AND FILLED TO CORRECT OIL LEVEL

D ACCUMULATOR PRESSURES—WHEELS FREE TO TURN

SHOULD CHECK			PRESSURES ACTUALLY CHECK			
NT AP	REAR PUMP	ACCUMU-LATOR	FRONT PUMP	REAR PUMP	ACCUMU-LATOR	
20	90	115	120	90		ACCUMULATOR PRESSURE I DRIVE RANGE MUST NO BE MORE THAN 10 LBS. UNDER FRONT PUMP PRESSURE
90	90	(80)	90	90	(50)	
20			120			
180	180	175	180	180		ACCUMULATOR PRESSUR LOW RANGE MUST N BE MORE THAN 5 L UNDER FRONT PUM PRESSURE
90	90	(85)	90	90	(55)	
180	180	175	180	180		
90	90	(85)	90	90	(55)	

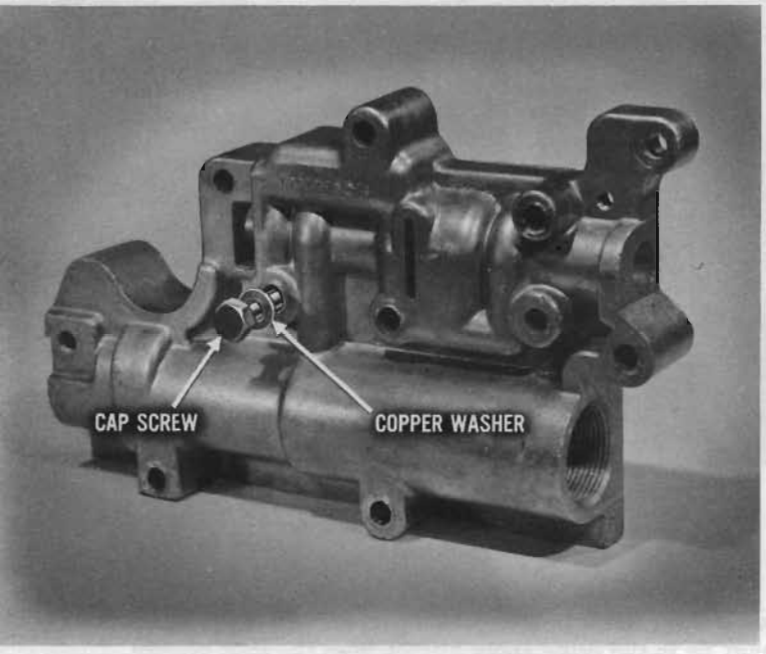
HOULD CUT OUT UNDER 2500 R.P.M. ACTUALLY CUTS OUT_____R.P.M.
PRESSURE DROPS TO APPROXIMATELY 20 LBS. WHEN REAR PUMP TAKES OVER)

Here's a case where we get a low reading in the high accumulator and correct readings in the front and rear pumps.



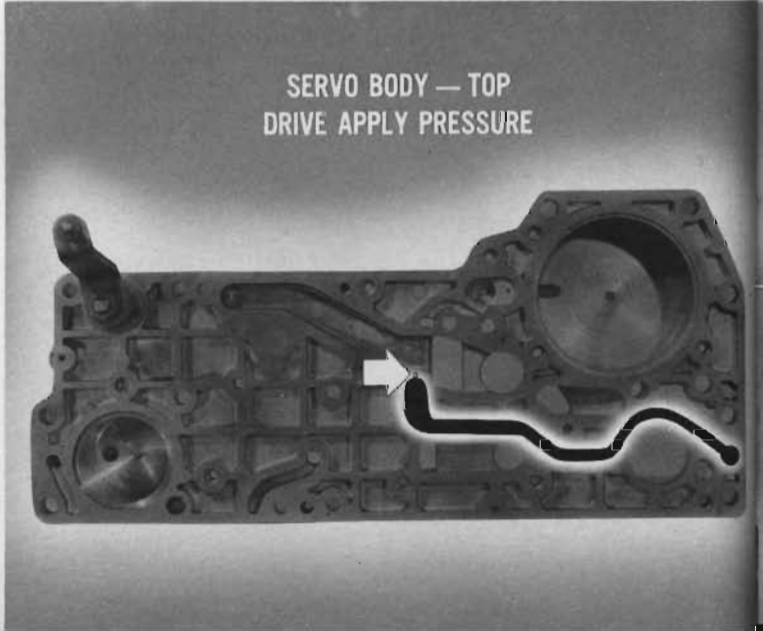
Since the front and rear pump pressures are okay, we know we are getting proper pressure through to the pressure regulator valve and shift control valve. So our trouble must be in the drive apply circuit from the shift control valve through the high accumulator to the clutch. The first thing to check in this case is the operation of the high accumulator, since it can be removed without taking out the whole transmission.

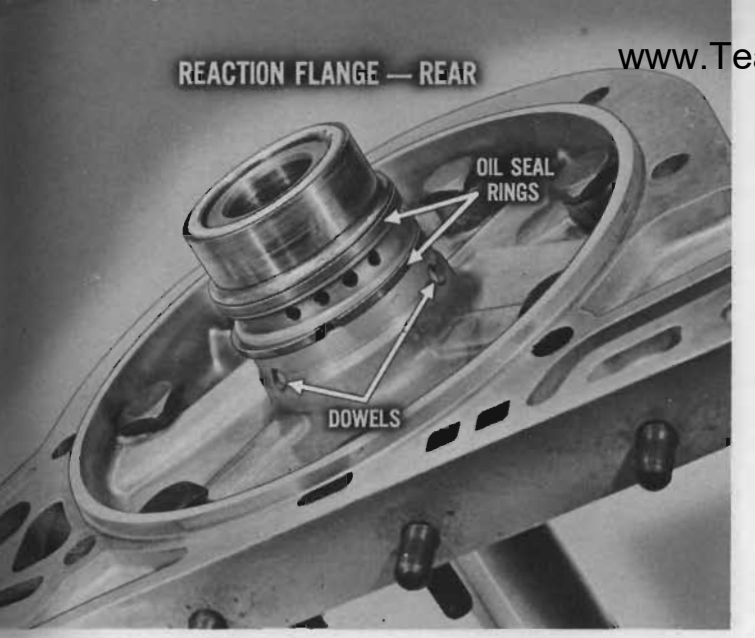
So, check the high accumulator gasket for possible leak. Try the accumulator piston for proper fit. A loose piston might be allowing too much oil to seep through and back to the oil pan. Inspect the metering orifice to make sure it isn't plugged. If the high accumulator is in order, then –



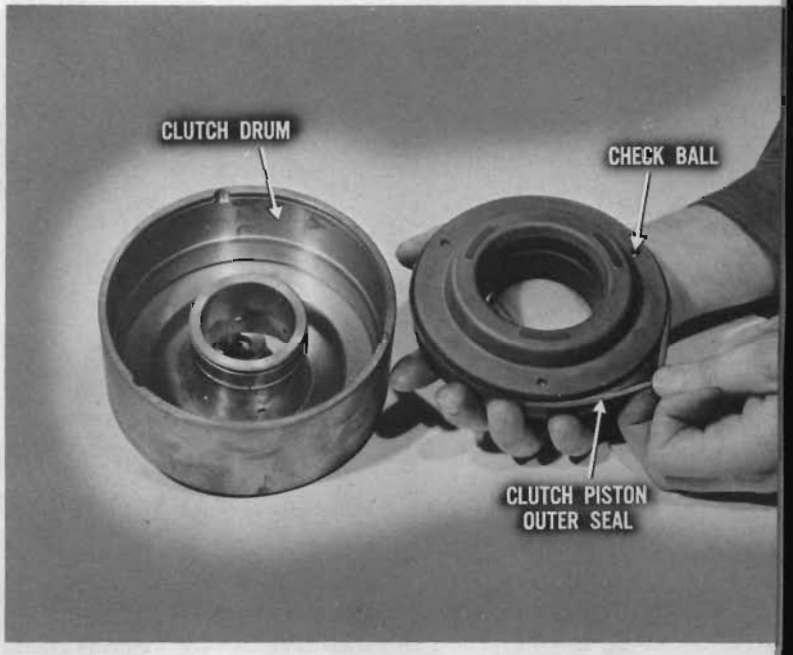
– check the cap screw with a copper washer at the bottom side of the valve body. This cap screw passes through the drive apply pressure channel. A leak around the copper washer, or if the copper washer has been left out, will cause a low pressure in the high accumulator and possibly faulty drive range operation. If this is okay, then –

– check the various parts through which drive apply pressure passes for possible leaks through the gaskets. If the entire circuit checks okay –

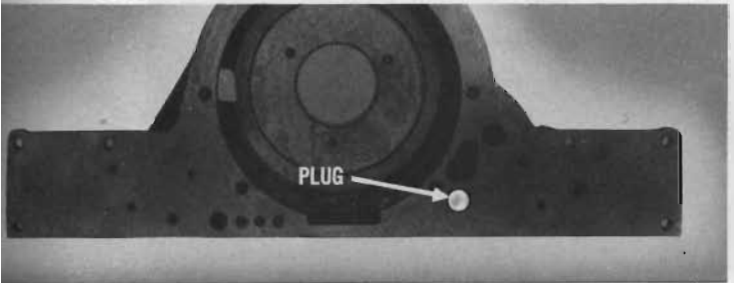




– look for leaking, broken, missing or improperly installed oil seal rings on the hub at the back face of the reaction flange. Also check the dowels. They may be loose, leaking, or missing.



Excessive wear in the clutch drum where the oil seal ring seats will also allow a leak. So inspect the clutch piston outer seal. Also make sure that the check ball is free and seating properly. Dirt or other material behind the ball may cause the trouble.



Here're two more possible causes of a low pressure reading at the high accumulator. First, a loose or leaking plug in the front side of the transmission case. The second cause is a stuck check ball in the reaction flange passage of the drive apply circuit. This is a vent to break the suction when the clutch is being released.

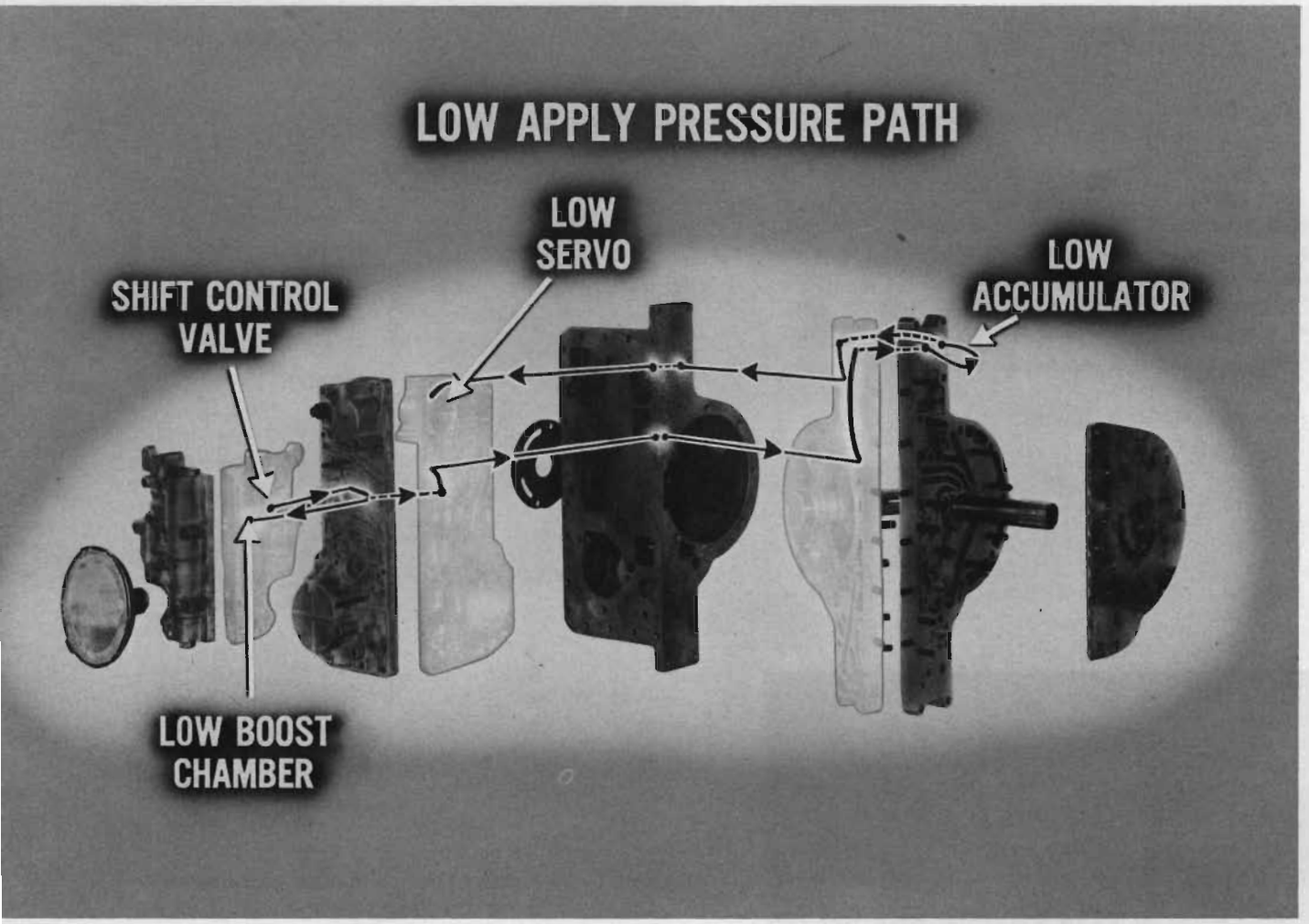
Now let's take up this case – front and rear pump pressures are okay, but the pressure in the low accumulator is low.

T BE WARMED TO NORMAL O
AND ADDED TO CORRECT OIL LEVEL

ACCUMULATOR PRESSURES—WHEELS FREE TO T

OULD CHECK			PRESSURES ACTUALLY CHECK			
	REAR PUMP	ACCUMU-LATOR	FRONT PUMP	REAR PUMP	ACCUMU-LATOR	
	90	(115)	120	90	(85)	ACCUMULATOR PRES DRIVE RANGE MUS BE MORE THAN UNDER FRONT PRESSURE
	90	80	90	90		
			120			
0	180	(175)	180	180	(145)	ACCUMULATOR PR LOW RANGE M BE MORE THAN UNDER FRONT PRESSUR
0	90	85	90	90		
30	180	(175)	180	180	(145)	
90	90	85	90	90		

ULD CUT OUT UNDER 2500 R.P.M. ACTUALLY CUTS OUT_____R.P
RESSURE DROPS TO APPROXIMATELY 20 LBS. WHEN REAR PUMP TAKES OVER



By checking the low apply pressure circuit we can easily see the possible sources of trouble. We know that the defect must be in this circuit since both pumps are delivering proper pressure. So the first thing to check is proper operation of the low accumulator since it can be removed and inspected without removal of the entire transmission. Check it for a loose piston and check the gasket and metered orifice. If the accumulator checks okay look for possible leaks in all of the parts through which the low apply pressure is channeled.

Also inspect the low servo piston seal for possible leaks.

Now let's take a case like this. All pressures check okay except the front pump pressure drops when the shift lever is in reverse range.

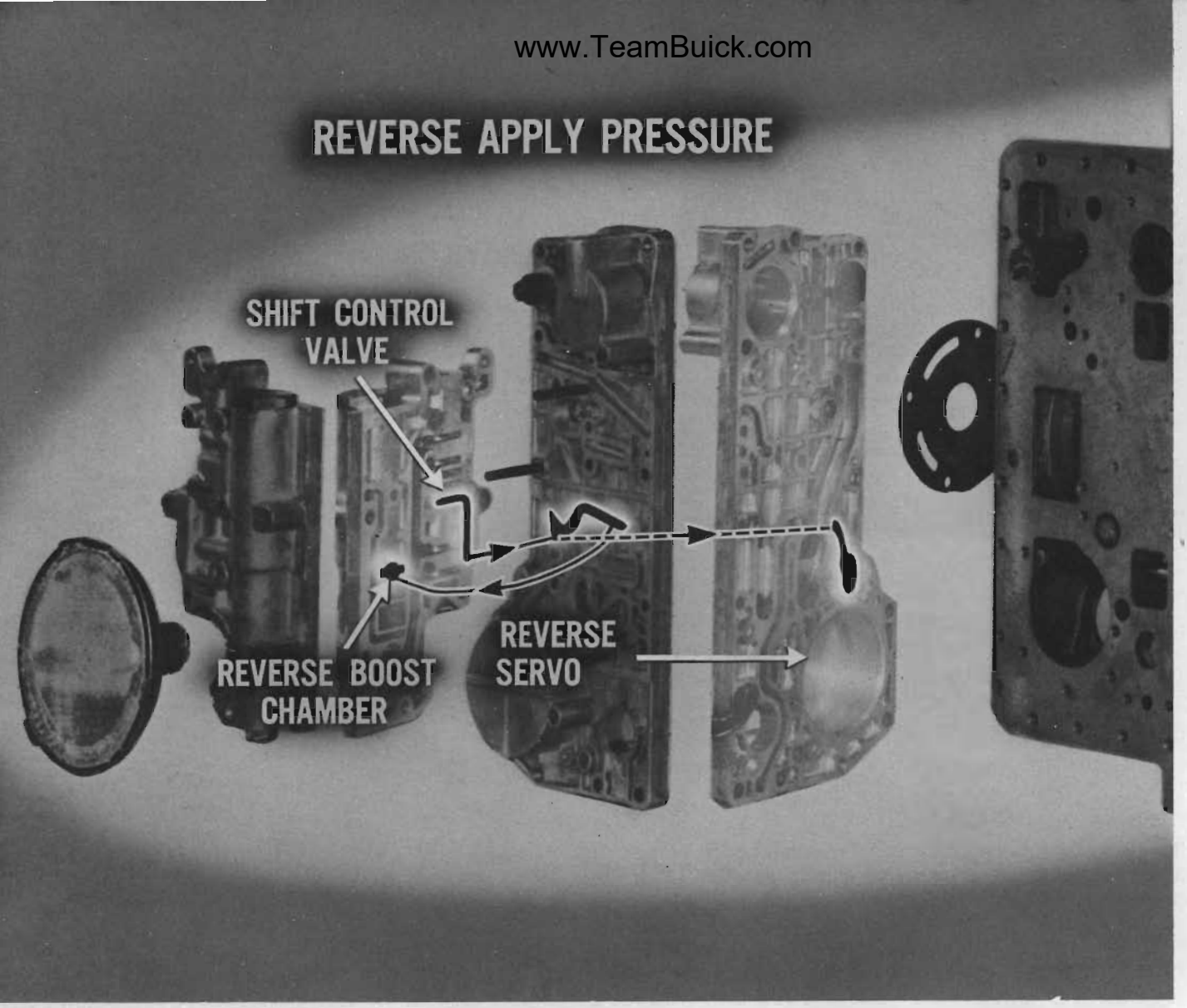
ALWAYS MAKE THE FOLLOWING CHECKS A
TRANSMISSION MUST BE WARMED TO NORMAL OPERA
AND FILLED TO CORRECT OIL LEVE

MINIMUM PUMP AND ACCUMULATOR PRESSURES—V

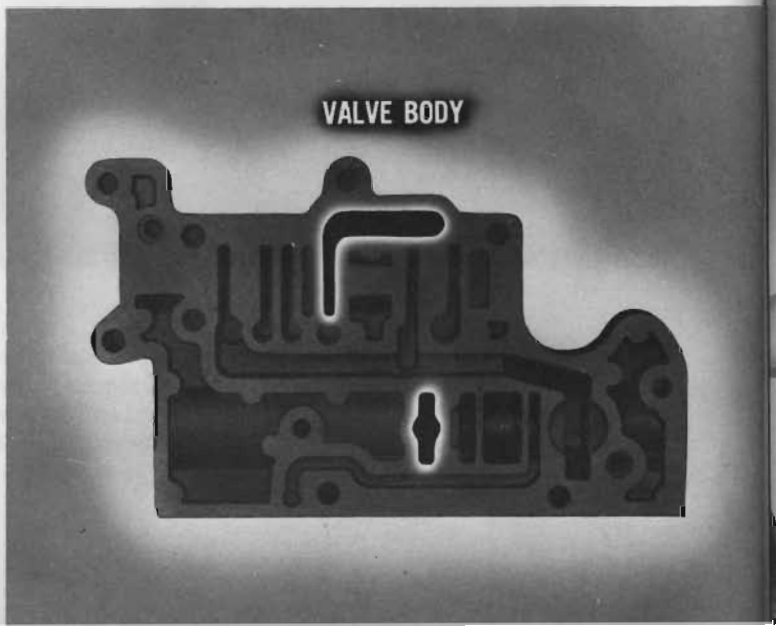
ENGINE R.P.M.	PRESSURES SHOULD CHECK	FRONT PUMP	REAR PUMP	ACCUMULATOR	FRONT PUMP	REAR PUMP	PRESSURE AC L
500	LOW	120	90	115	120	90	
	DRIVE	90	90	80	90	90	
	REVERSE	120			90		
1000	LOW	180	180	175	180	180	
	DRIVE	90	90	85	90	90	
1800	LOW	180	180	175	180	180	
	DRIVE	90	90	85	90	90	

FRONT PUMP SHOULD CUT OUT UNDER 2500 R.P.M. ACTI
(FRONT PUMP PRESSURE DROPS TO APPROXIMATELY 20 LBS. W

OIL LEAK CHECKS



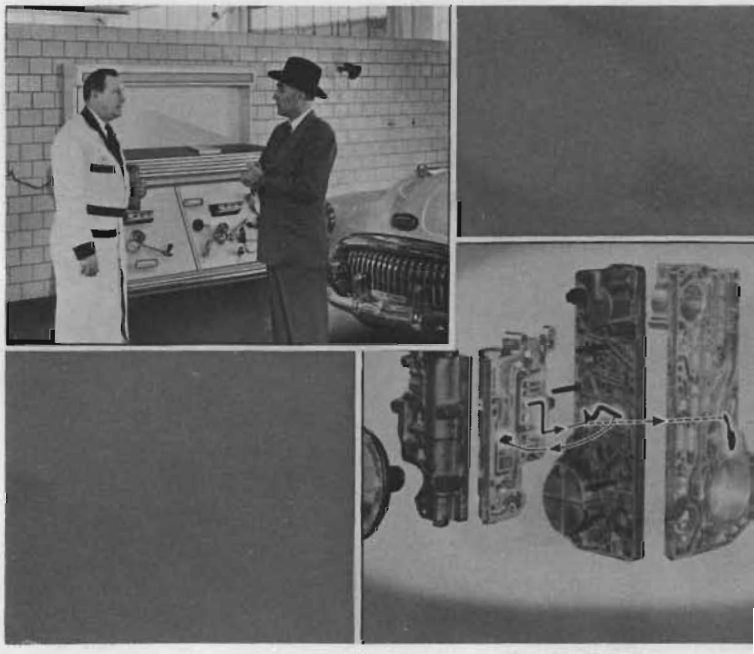
As we can see the reverse apply pressure is channeled through only two parts of the transmission – the valve body and the servo body. Therefore we know that we don't have to pull the whole transmission. We just take down the oil pan, suction pipe and screen, valve body and servo body.

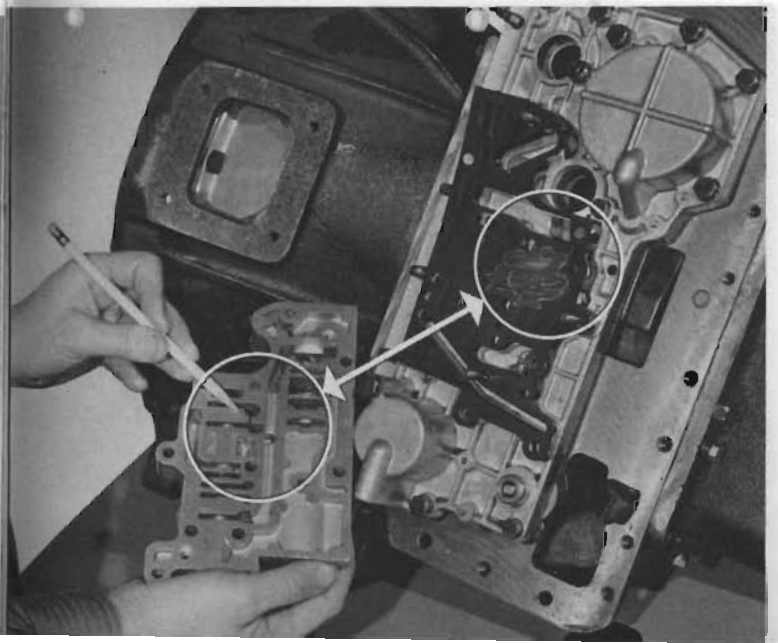


Then check the reverse apply pressure passages in the valve body for possible leaks. Also inspect the gasket between the valve and servo bodies.

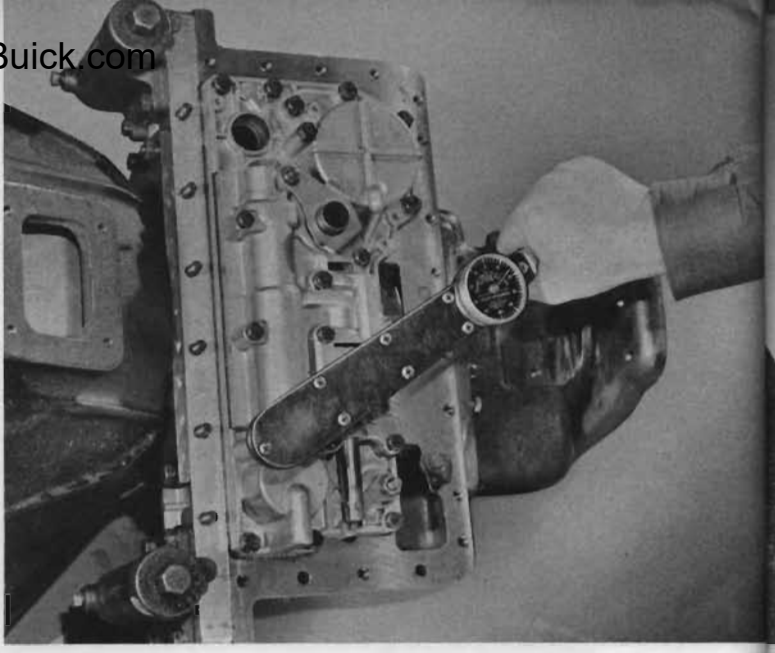
Then check the reverse apply pressure channels in both sides of the servo body. Also inspect the reverse servo piston seal for possible pressure leakage.

So – as we have seen, diagnosis and tracking down of Dynaflow hydraulic troubles can be quick and sure. All it takes is the step-by-step procedure followed by doctors, along with thorough knowledge of the internal hydraulic pressure flow in the various ranges.

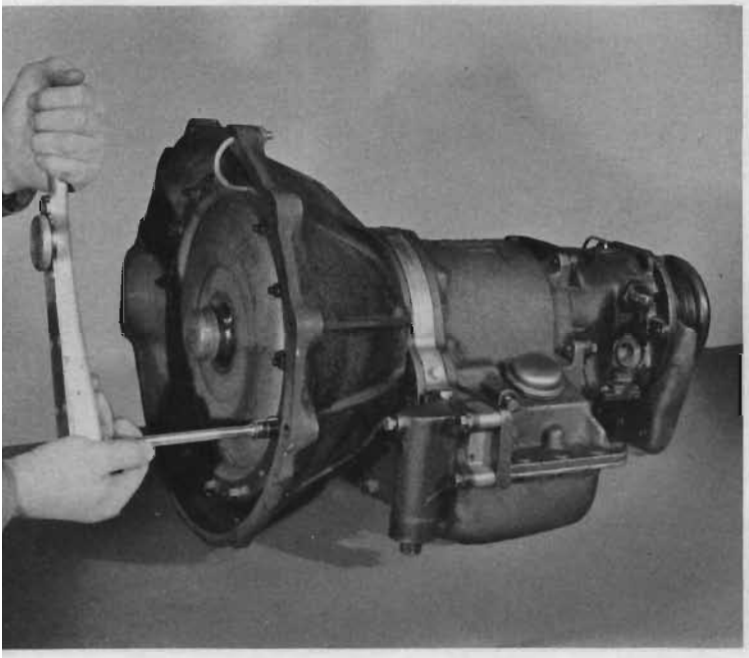




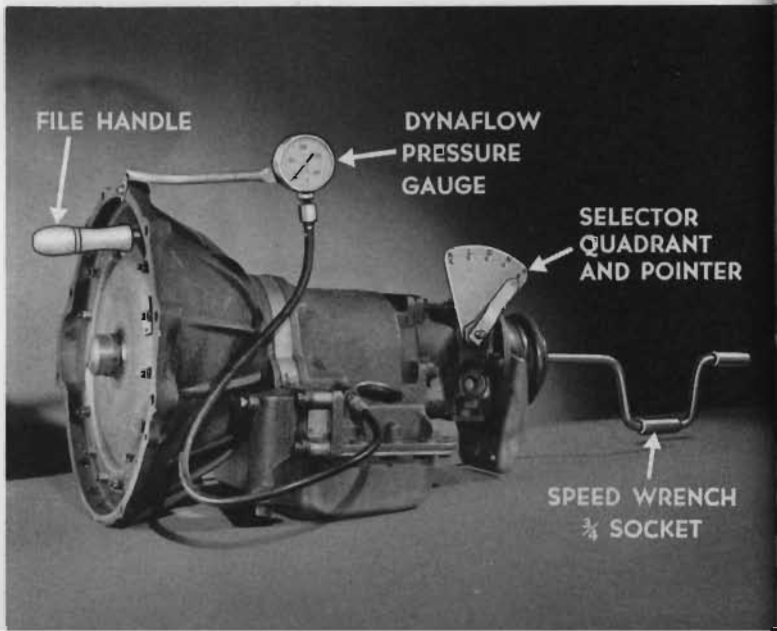
In disassembling Dynaflow, experienced mechanics have learned that careful inspection of the mating parts and gaskets can give them clues as to where the trouble is. For example, nicks and burrs along channels will show up on the mating gasket surfaces. Portions of gaskets wet with oil indicate improper sealing at those points.



In reassembling, it is important to follow all torquing specifications as well as using new gaskets. Be sure to leave the gaskets in their protective envelopes until you're ready to use them. And cleanliness should be a watchword. Then –

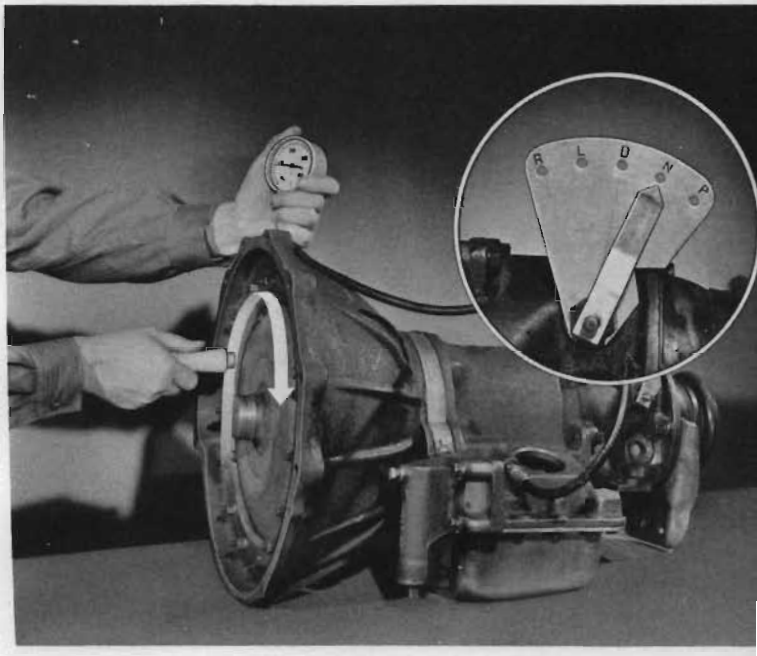


– after reassembly, it is an advantage to bench-test the Dynaflow before installing it in the car. A little time spent in making tests on the bench may save hours of installation and removal time. Let's see how a bench test should be made.

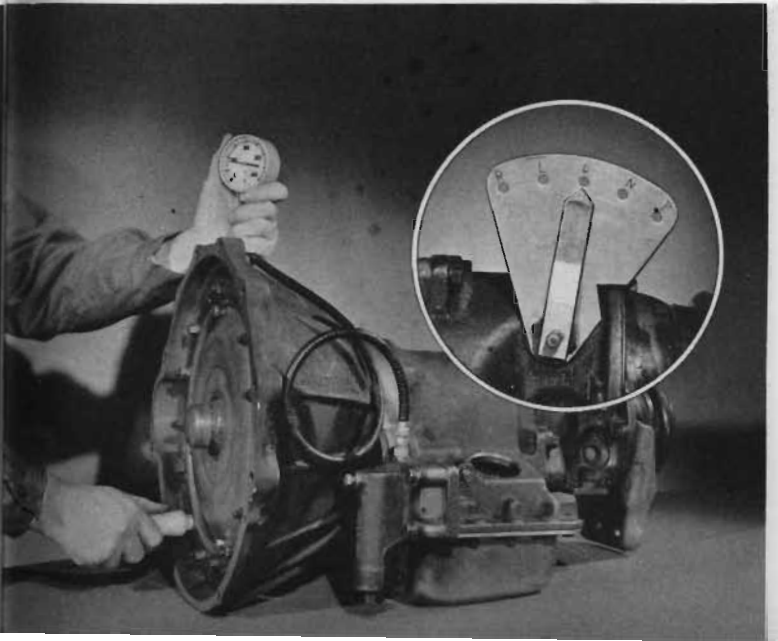


Here's a bench-test setup. Use a file handle for a crank on one of the primary pump studs. Use a speed wrench with the special three-quarter socket from the Dynaflow tool kit for a crank in testing rear pump operation. Then install a test selector quadrant under the cross shaft bearing. A template for making this tool is provided with this booklet. Next remove the low and reverse band adjusting hole covers. Fill the transmission with Dynaflow oil to the level of the holes. And, of course, you'll need a Dynaflow pressure gauge. To complete the job –

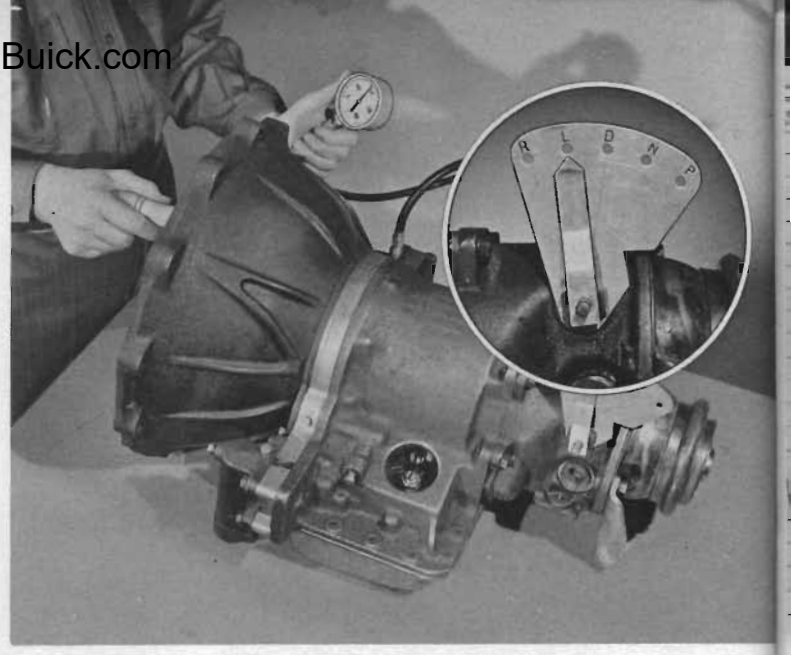
– adjust the selector quadrant. Set the pointer as far as it will go toward the "Park" position. Now adjust the quadrant face so the pointer lines up with the "Park" position. To check for proper linkage travel push the pointer past the "Park" position. It should move from one-eighth to three-sixteenths of an inch against the spring pressure.



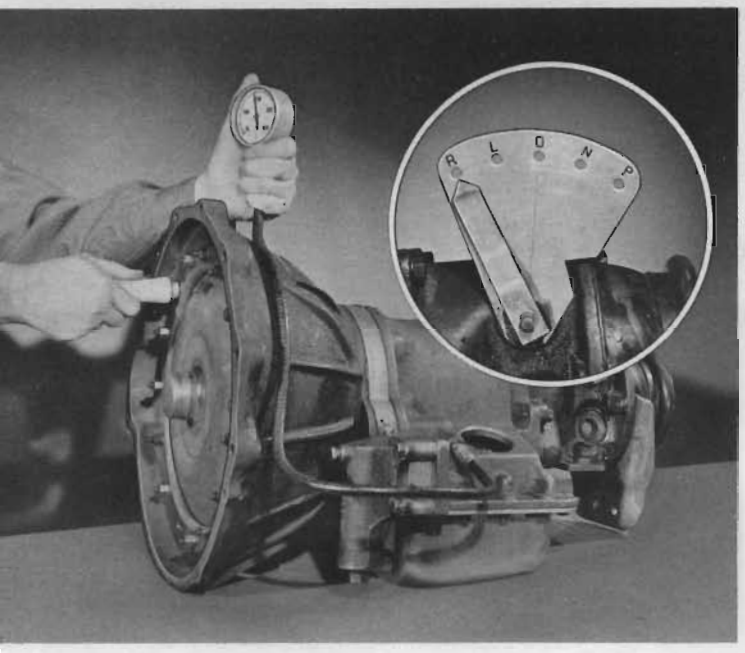
Install the pressure gauge for a front pump pressure check. Set the pointer to neutral. Then turn the primary pump clockwise at about sixty to eighty revolutions per minute. In about a minute you should get a reading on the gauge of ninety pounds. If the reading is less than that, look for the cause at the points previously covered.
If there is a binding it is a sure bet that the front pump drive gear has been installed wrong.



Now install the gauge for a pressure check in the high accumulator. Put the selector in drive position and again turn the primary pump clockwise at about sixty to eighty revolutions per minute. Do not expect the output shaft to turn. The speed of the bench-test rotation is not fast enough to transmit output torque. The pressure should be ninety pounds. If the pressure reading is low, look for the troubles at the points outlined previously.

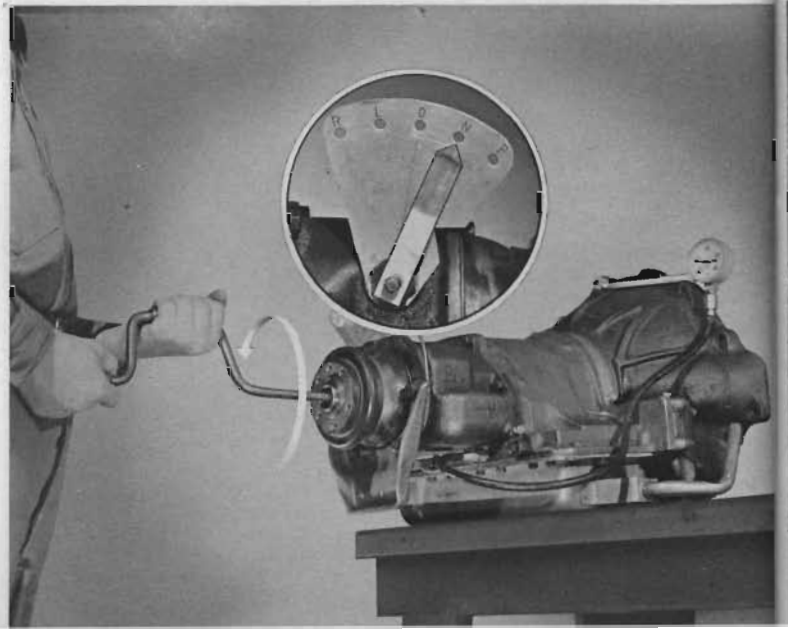


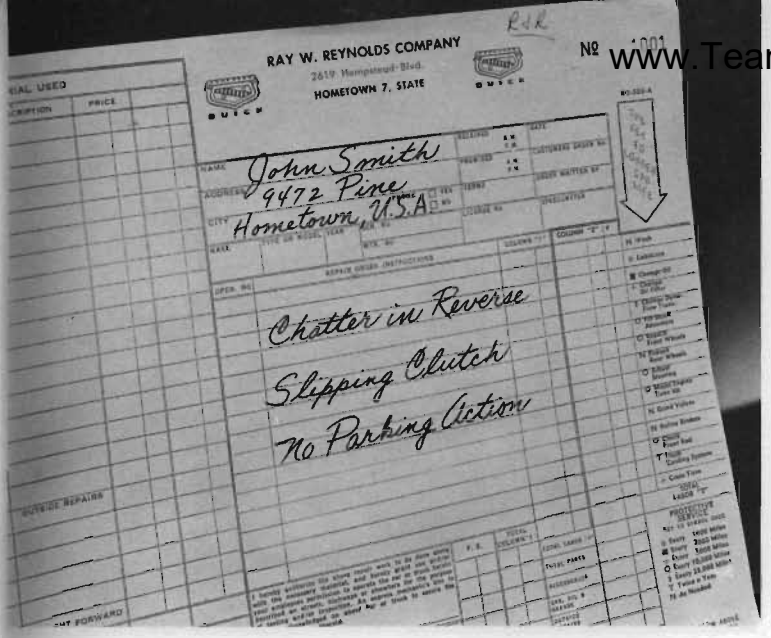
Next, install the pressure gauge for a check of the low accumulator. Put the selector in low position and turn the primary pump as before. The pressure reading should be one hundred eighty pounds. Watch the low band through the inspection hole to make sure it is operating. A low pressure reading indicates trouble in the areas previously covered.



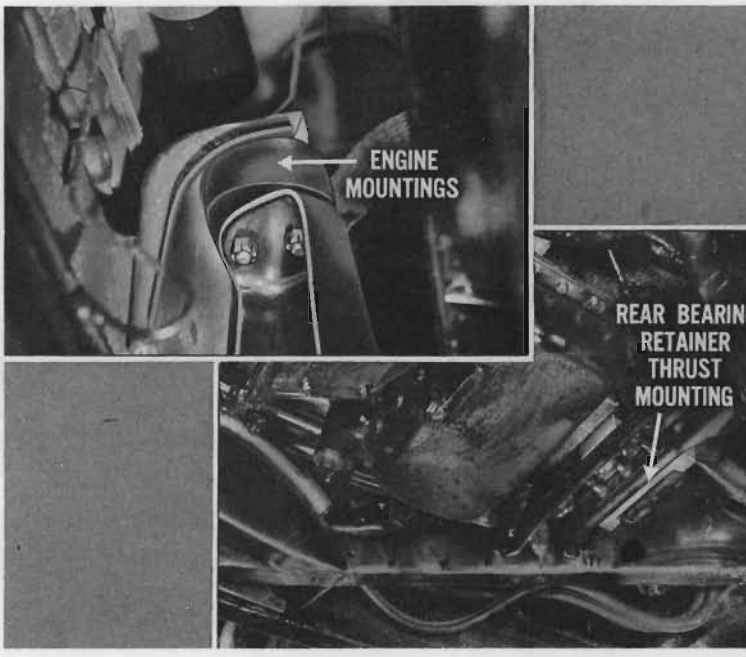
Now check the reverse apply pressure. This is done by checking the front pump pressure while the selector is in the reverse position. The reading should be one hundred eighty pounds. While making this check be sure to check the operation of the reverse band. It should apply as soon as the pressure reaches about ninety pounds.

A check of the rear pump pressure completes the bench test. With the selector in neutral and a gauge connected in the rear pump channel, turn the speed wrench counterclockwise. You should get a reading of ninety pounds. If no pressure is shown, chances are that the key in the rear pump drive gear was left out in assembly. If the Dynaflow passes the bench test you can be reasonably sure that it's okay and ready for installation in the car.





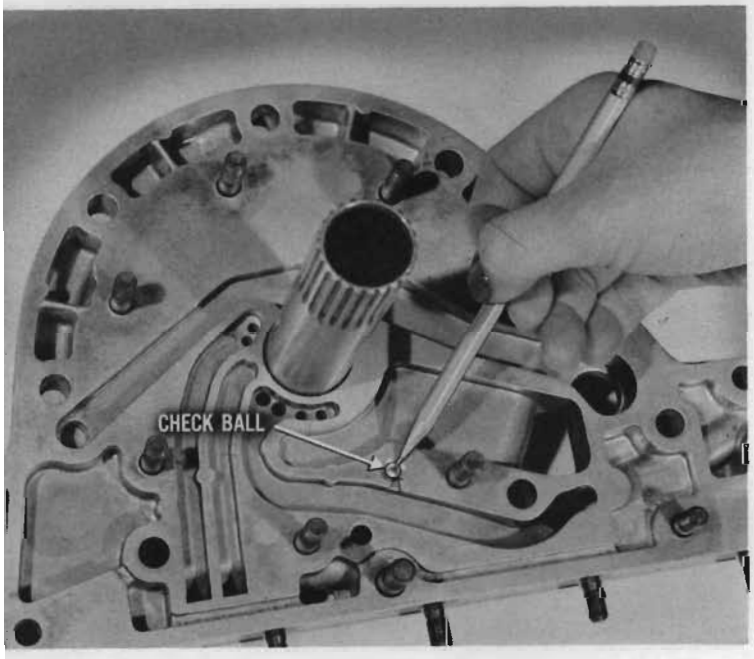
Now let's take up some ailments which might not show up in the pressure checks – things like a chatter in reverse, slipping clutch, and no parking action.



In cases of chatter in reverse, first check the engine mounts to see that they are tight and in good condition. Then check to be sure that the rear bearing retainer thrust mounting is tight. Also inspect it to see that the rubber pad has not separated from the metal bracket.

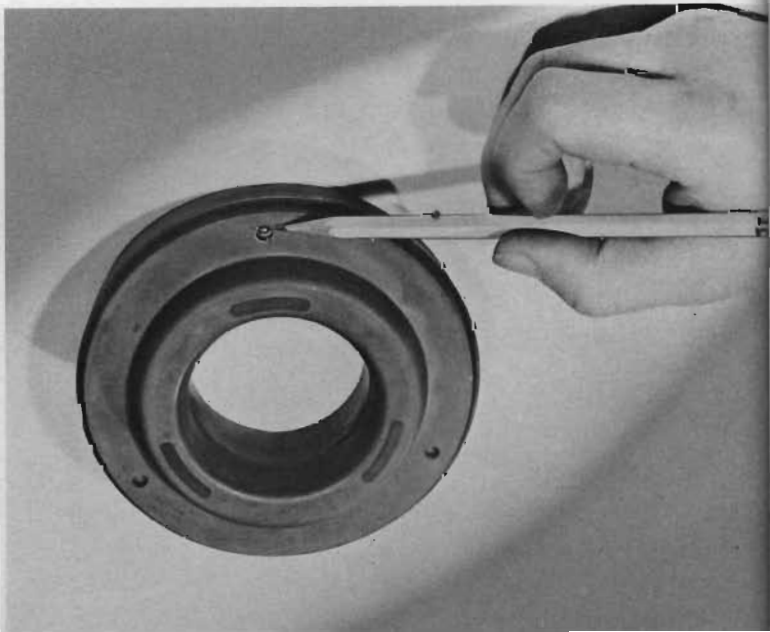
In most cases a chatter in reverse indicates a partially engaged clutch. To check this – run the engine at about fifteen hundred r.p.m. with the shift lever in neutral. If the car creeps forward excessively –

– check for burned, warped, stuck or improperly dished clutch plates.



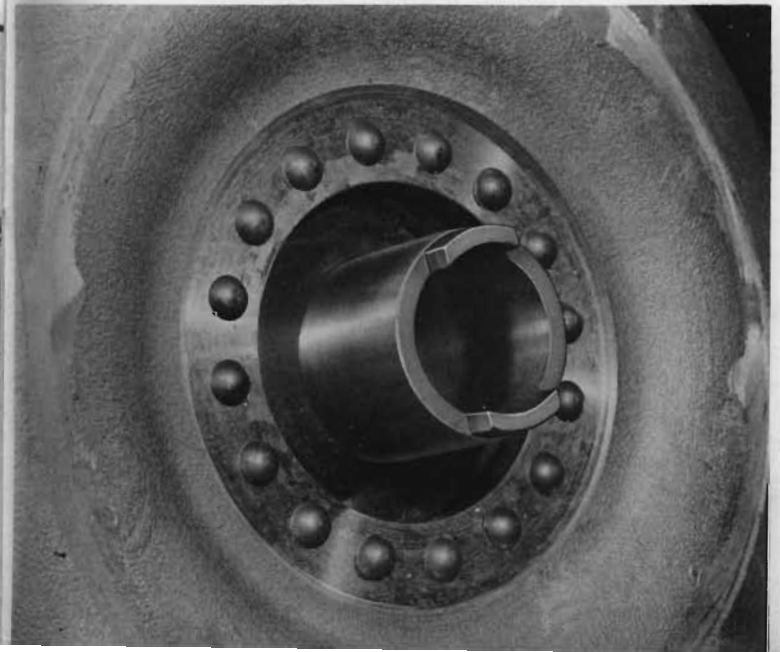
Then inspect for an improperly seating ball in the reaction flange. It should also rattle when the flange is shaken.

In cases of slipping clutches on low mileage cars chances are that the condition is caused by a stuck check ball in the clutch piston. This is usually caused by a tiny piece of nutshell chip or dirt being caught in the check ball seat. Nutshells are used as blasting material in the manufacturing process to remove machining burrs. Occasionally a small piece remains to cause the trouble. The check ball should be free in the piston and should rattle when the piston is shaken. Before shaking the piston, check to see if the ball is free. Shaking the piston first may loosen a stuck ball. If you find the ball is stuck, you have found the cause of the trouble.

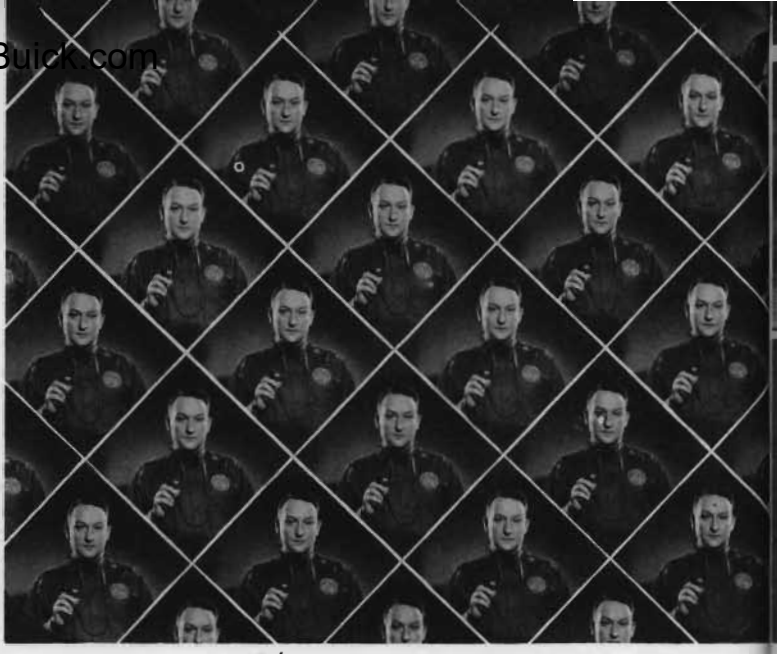


In many cases of no parking action in the park position, the parking pawl linkage has become disconnected. This can be fixed without removing the transmission from the car. Jack back the rear axle assembly, remove the torque ball and universal joint. Then the parking pawl linkage can be inspected. Sometimes a mirror may be necessary. There is enough working room here to reconnect the parking pawl linkage. If the pawl is broken, it will be necessary to remove the transmission rear bearing retainer to make the repair.

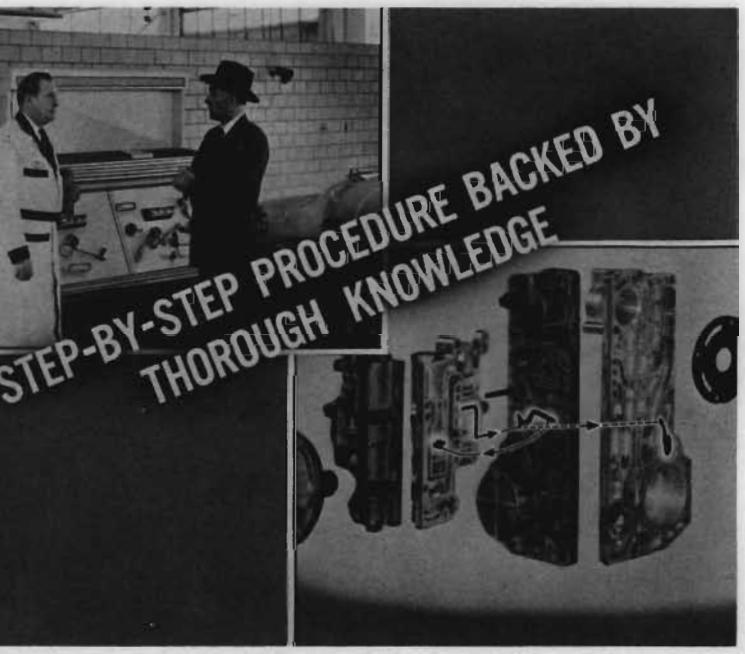
In cases of severe leakage past the front pump seal, chances are that the bushing has been scored and an hour glass condition exists on the primary pump hub. To check for this, use a straight edge on the hub. If daylight shows through between the hub and the straight edge, replace the primary pump.



Lack of sufficient lubrication at the front pump seal and bushing will cause excessive heat which will show a blue circle on the inside of the front pump seal hub. A discolored hub is also probably hour-glassed and leaking. It should be replaced.



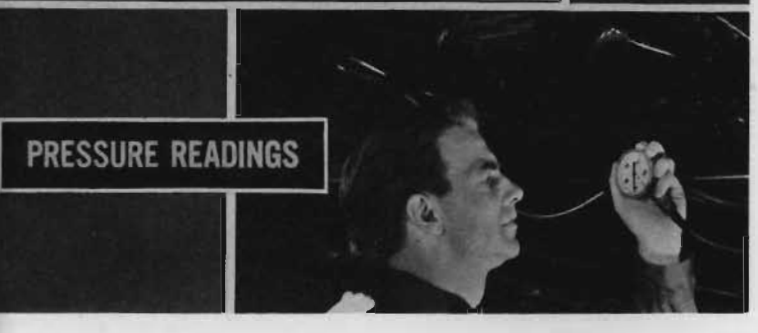
Yes, each and every one of us can be a doctor of Dynaflow by taking a tip from doctors of medicine.

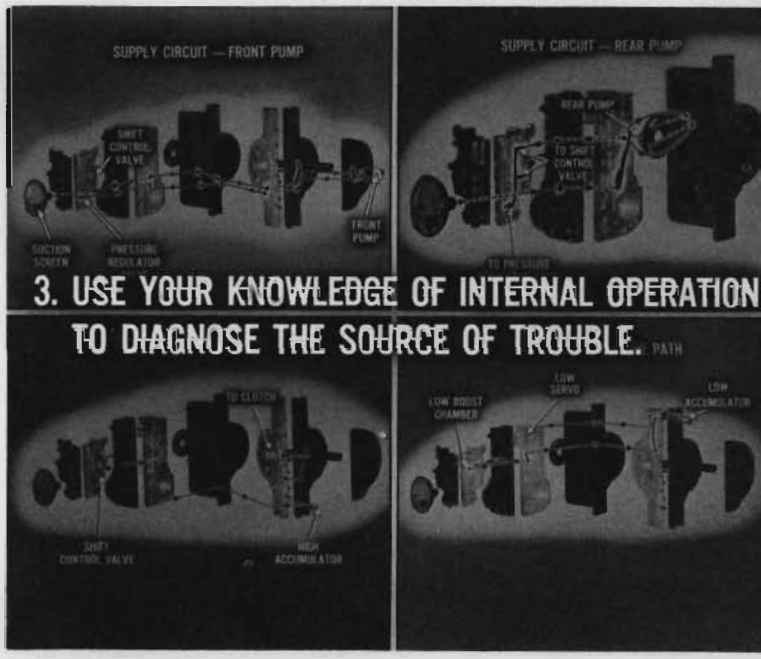


So – use the logical step-by-step procedure backed by your thorough knowledge of the internal flow of hydraulic pressure in the Dynaflow Transmission. This will help us track down and cure Dynaflow troubles quickly and with confidence that the repair is right – the first time.

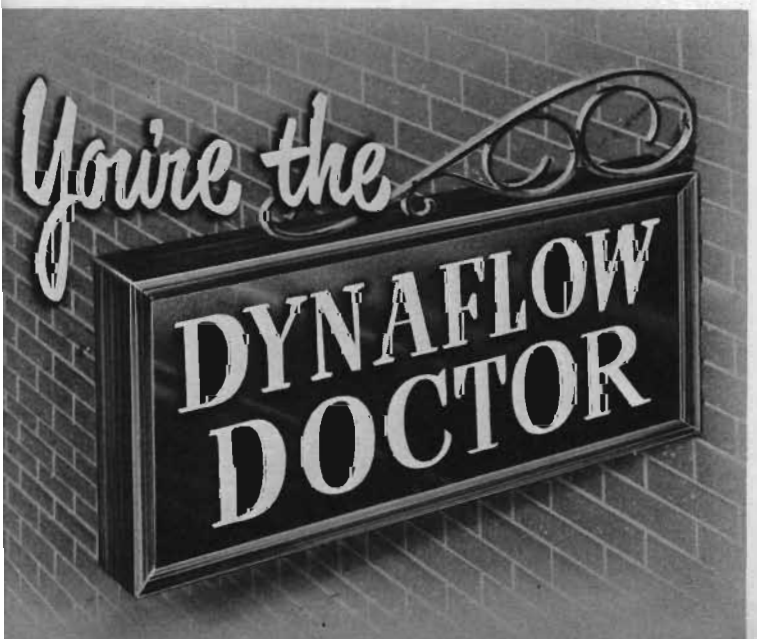
First, listen to the owner's story – ask questions. This will give you the first clues on where to look for trouble. Next –

– check the system – road test and then take pressure readings. This will give you more definite clues as to where the trouble might be on the inside.

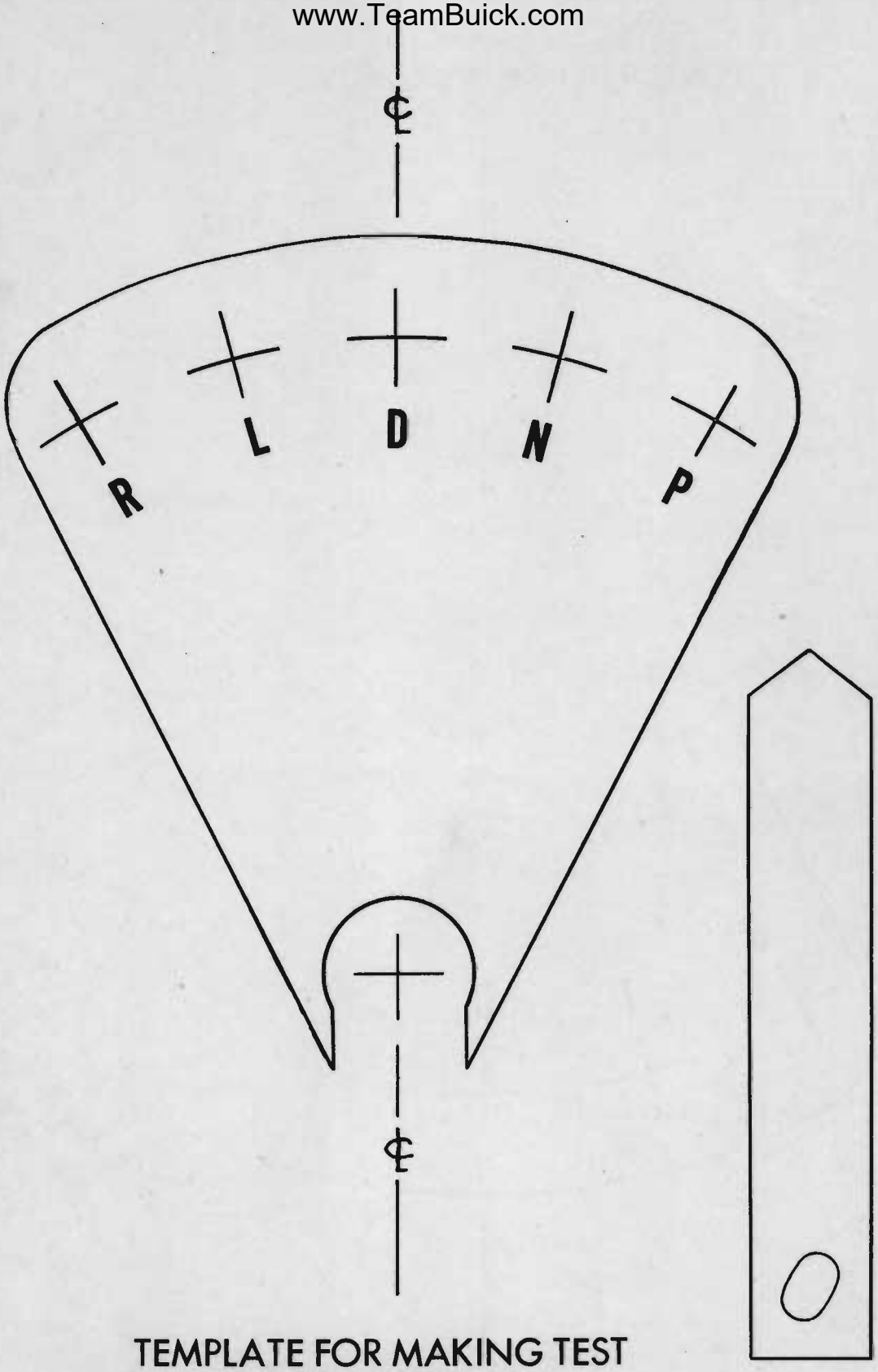




And third, use your knowledge of internal operation to diagnose the source of trouble. Remember –



– you're the Dynaflow doctor.



TEMPLATE FOR MAKING TEST
SELECTOR QUADRANT