THE *Indian*
MOTORCYCLE COMPANY

I-125/ 175 ENGINE

SERVICE MANUAL

PART Nº 80601056

FOREWORD

THIS MANUAL HAS BEEN WRITTEN FOR USE BY AUTHORIZED INDIAN DEALERS AND THEIR QUALIFIED MECHANICS. IN LIGHT OF THIS PURPOSE IT HAS BEEN ASSUMED THAT CERTAIN BASIC MECHANICAL PRECEPTS AND PROCEDURES INHERENT TO OUR PRODUCT ARE ALREADY KNOWN AND UNDERSTOOD BY THE READER.

WITHOUT SUCH BASIC KNOWLEDGE, REPAIRS OR SERVICE TO THIS MODEL MAY RENDER THE MACHINE UNSAFE, AND FOR THIS REASON WE MUST ADVISE THAT ALL REPAIRS AND/OR SERVICE BE PERFORMED BY AN AUTHORIZED INDIAN DEALER WHO IS IN POSSESSION OF THE REQUISITE BASIC PRODUCT KNOWLEDGE. OTHER INFORMATION IS SUPPLIED BY THE INDIAN MOTORCYCLE COMPANY AND IS NECESSARY TO PROVIDE TECHNICAL COVERAGE REGARDING THE PRODUCT. THE RESEARCH, ENGINEERING AND SERVICE DEPARTMENTS OF INDIAN ARE CONTINUALLY STRIVING TO FURTHER IMPROVE ALL MODELS MANUFACTURED BY THE COMPANY. MODIFICATIONS ARE THEREFORE INEVITABLE AND CHANGES IN SPECIFICATIONS OR PROCEDURES WILL BE FORWARDED TO ALL AUTHORIZED INDIAN DEALERS AND WILL, WHERE APPLICABLE, APPEAR IN FUTURE EDITIONS OF THIS MANUAL.

THIS MANUAL, AND THE TECHNICAL AND SERVICE INFORMATION ENCLOSED, SHOULD BE CLOSELY FOLLOWED TO ENABLE YOU TO PROPERLY MAINTAIN THE MACHINE, THEREBY ENSURING CONTINUOUS GOOD PERFORMANCE AND LONG SERVICE LIFE.

EVEN THOUGH THIS INFORMATION APPLIES TO SEVERAL MODELS, MANY OF THE SERVICING PROCEDURES ARE IDENTICAL. WHENEVER THERE IS A DIFFERENCE IN SPECIFICATIONS AND/OR SERVICING PROCEDURE, THE INDIVIDUAL MODELS WILL BE NOTED. UNLESS OTHERWISE MARKED, CONSIDER THE INFORMATION TO BE UNIVERSALLY APPLICABLE.

INDIAN SERVICE DEPARTMENT

THE Indian MOTORCYCLE COMPANY

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FEATURES OF I SERIES ENGINES

HIGH-PERFORMANCE SINGLE CYLINDER ENGINE

THE INDIAN I-125-175 SERIES UTILIZES A POWERFUL TWO-STROKE 125CC AND 175CC ENGINE. THE NEW SIX PORT CYLINDER, WHICH IS ANOTHER INDIAN TECHNICAL DEVELOPMENT, GREATLY IMPROVES ENGINE EFFICIENCY AND IS RESPONSIBLE FOR HIGH POWER OUTPUT THROUGHOUT A BROAD RPM RANGE.

HIGHLY-DEPENDABLE INDIAN AUTOLUBE

INDIAN AUTOLUBE PROVIDES SUPERIOR ENGINE LUBRICATION THAT EXTENDS THE LIFE OF THE ENGINE.

EASY STARTING

THE ENGINE CAN BE STARTED BY SIMPLY DISENGAGING THE CLUTCH AND KICKING THE KICK PEDAL WITHOUT SHIFTING GEARS BACK TO NEUTRAL

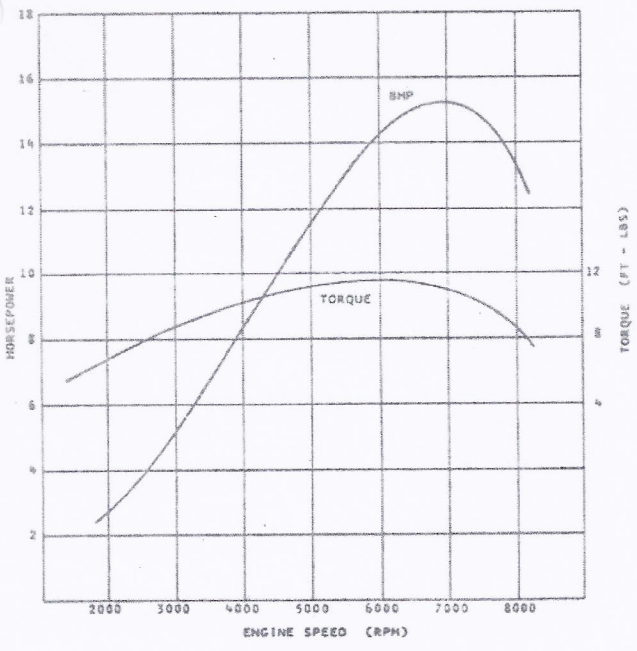
SPECIFICATIONS AND PERFORMANCE

ENGINE:		
MODEL	I-175	I-125
TYPE	2 STROKE, GASOLINE	2 STROKE, GASOLINE
LUBRICATING SYSTEM	INDIAN AUTOLUBE	INDIAN AUTOLUBE
CYLINDER	SINGLE, 6 PORT	SINGLE, 6 PORT
DISPLACEMENT	171 CC	123 CC
BORE X STROKE	66 X 50MM	56X50MM
COMPRESSION RATIO	7:1	7:1
MAX. POWER	15.6BHP/7,000RPM	11.5BPH/7,500RPM
MAX. TORQUE	11.9FT-LB/5,500RPM	8.5FT-LB/6,000RPM
STARTING SYSTEM	KICK STARTER	KICK STARTER
IGNITION SYSTEM	MAGNETO IGNITION	MAGNETO IGNITION
IGNITION TIMING	2.0MM B.T.D.C.	2.0MM B.T.D.C.
SPARK PLUG	NGK B-8ES, CHAMPION N-3	NGK B-8ES, CHAMPION N-3
CARBURETOR:		
TYPE	VM26SC2	VM26SC2
M.J.	#170	#170
NEEDLE	5 FL11-3	5 FL11-3
AIR CLEANER:	WET, FOAM RUBBER	WET, FOAM RUBBER
TRANSMISSION:		
CLUTCH	WET, MULTIPLE-DISK	WET, MULTIPLE-DISK
PRIMARY SYSTEM	GEAR	GEAR
PRIMARY RATIO	3.894 (74/19)	3.894 (74/19)

MODEL	I-175	I-125
MAGNETO:		
MODEL	F136-08404A	
MANUFACTURER	HITACHI, LTD.	

GEAR BOX:			
TYPE		CONSTANT MESH, 5-SPEED FORWARD	
REDUCTION RATIO	1ST	3.181 (35/11)	34.83
	2ND	2.000 (30/15)	21.90
	3RD	1.368 (26/19)	14.98
	4TH	1.000 (23/23)	10.95
	5TH	0.800 (20/25)	8.76
SECONDARY REDUCTION SYSTEM		CHAIN	
SECONDARY REDUCTION RATIO		2.812 (45/16)	
OIL CAPACITY		1000CC 1 QT	

PERFORMANCE CURVES



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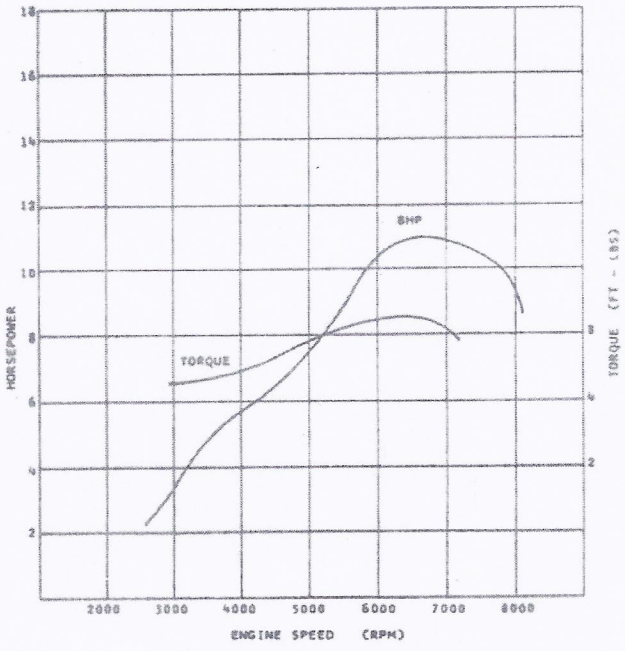
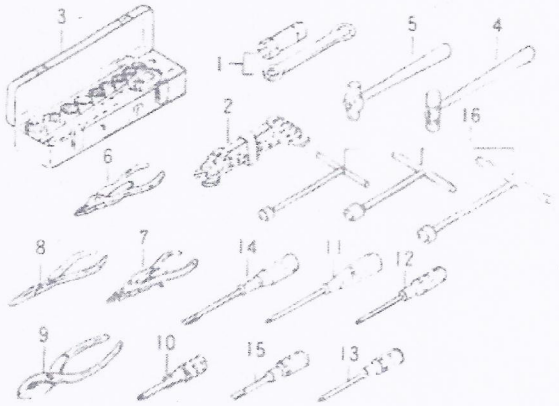


I - 1 2 5 E N G I N E

TOOLS AND INSTRUMENTS FOR SHOP SERVICE

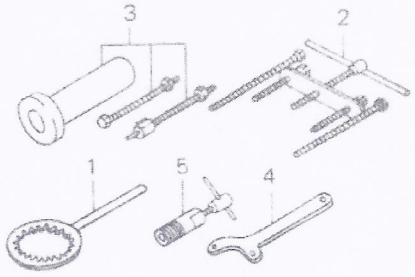
THE FOLLOWING TOOLS AND INSTRUMENTS ARE REQUIRED TO SERVICE THE I-125-175 SERIES ENGINES:

1) GENERAL TOOLS



1)PLUG WRENCH 23X29MM
2)A SET OF WRENCHES
3)A SET OF SOCKET WRENCHES
4)PLASTIC TIP HAMMER
5)STEEL HAMMER
6)CIRCLIP PLIERS (ST TYPE)
7)CIRCLIP PLIERS (RT TYPE)
8)NEEDLENOSE PLIERS
9)PLIERS
10)PHILLIPS-HEAD SCREWDRIVER
11)PHILLIPS-HEAD SCREWDRIVER (L)
12)PHILLIPS-HEAD SCREWDRIVER (M)
13)PHILLIPS-HEAD SCREWDRIVER (S)
14)SLOT-HEAD SCREWDRIVER (M)
15)SLOT-HEAD SCREWDRIVER (S)
16)T-HANDLE SOCKET WRENCH

2) SPECIAL TOOLS AND INSTRUMENTS



1)CLUTCH HOLDING TOOL
2)CRANKCASE DISASSEMBLING TOOL
3)CRANKSHAFT ASSEMBLING TOOL
4)FLYWHEEL MAGNETO HOLDING TOOL
5)FLYWHEEL MAGNETO PULLER

IN ADDITION, AN ELECTRO-TESTER, TACHOMETER (ENGINE RPM METER) HYDROMETER, ETC, SHOULD BE OBTAINED.

PERIODIC INSPECTION AND LUBRICATION

THESE CHARTS SHOULD BE CONSIDERED STRICTLY AS A GUIDE TO GENERAL LUBRICATION AND MAINTENANCE PERIODS. YOU MUST TAKE INTO CONSIDERATION THAT WEATHER, TERRAIN, GEOGRAPHICAL LOCATIONS, AND A VARIETY OF INDIVIDUAL USES ALL TEND TO DEMAND THAT EACH OWNER ALTER THIS TIME SCHEDULE TO MATCH HIS ENVIRONMENT. IF THE MOTORCYCLE IS CONTINUALLY OPERATED IN AN AREA OF HIGH HUMIDITY, THEN ALL PARTS MUST BE LUBRICATED MUCH MORE FREQUENTLY THAN SHOWN ON THE CHART TO AVOID THE RAVAGES OF WATER ON METAL PARTS.

ITEM	DEALER PROCEDURE	INTERVAL				
		1ST 200 MI. 30 DAYS	2ND 500 MI.	3RD 1000 MILES OR 60 DAYS	4TH 3000 MILES OR 90 DAYS	5TH 5000 MILES OR 5TH MONTH
AIR FILTER	CLEAN & LUBRICATE.	X	X	X	X	X
FUEL FILTER(S)	REMOVE & CLEAN.			X	X	X
OIL INJECTION	ADJUST PUMP-LUBE CABLE & JUNCTION CHECK CABLE ROUTING.	X	X	X	X	X
THROTTLE & CLUTCH	CHECK OPERATION-ADJUST-LUBE-CHECK CABLE ROUTING.	X	X	X	X	X
DRIVE CHAIN	CHECK CONDITION-CLEAN AND LUBRICATE-ADJUST AS REQD.	X	X	X	X	X
MISC FITTINGS	TIGHTEN ALL FITTINGS & FASTENERS.	X	X	X	X	X
IGNITION SYSTEM	ADJUST TIMING-CHECK SPARK PLUGS, POINTS & POINT CAM WICK.	X	X	X	X	X
CARBURETOR	CHECK EXTERNAL ADJUSTMENTS, FITTINGS & OPERATION, DISASSEMBLE, CLEAN, REINSTALL & ADJUST.		X	X	X	X
ENGINE	CHECK COMPRESSION. CLEAN & DECARBONIZE EXHAUST PIPE(REPACK MUFFLER AS REQD)DISASSEMBLE & DECARBONIZE TOP END.			X	X	X
TRANSMISSION	REPLACE OIL	X	X	X	X	X
BATTERY	CHECK ELECTROLYTE LEVEL, SPECIFIC GRAVITY	X	X	X	X	X
SHIFT MECHANISM	CHECK OPERATION, ADJUSTMENT-LUBRICATE.		X	X	X	X

IMPORTANT NOTE:
PRE-OPERATIONAL CHECKS SHOULD BE MADE EACH TIME THE MACHINE IS USED. SUCH AN INSPECTION CAN BE THOROUGHLY ACCOMPLISHED IN A VERY SHORT TIME; AND THE ADDED SAFETY IT ASSURES THE RIDER IS MORE THAN WORTH THE EXTRA TIME INVOLVED. PERIODIC INSPECTION INTERVALS MUST BE CONSIDERED AS THE MAXIMUM ALLOWABLE INTERVAL BETWEEN INSPECTIONS AND/OR ADJUSTMENTS. THESE INTERVALS MUST BE REDUCED UNDER HARD OR ABNORMAL USAGE. IN ADDITION, SHOULD THE MACHINE RECEIVE ANY KIND OF ABUSE/DAMAGE FROM SUCH THINGS AS UPSET, VANDALISM, ETC., THE UNIT SHOULD BE THOROUGHLY INSPECTED BEFORE USING IT AGAIN.

**NOTE: AIR CLEANERS ARE OF THE WET FOAM TYPE, IF USED CONTINUALLY IN DIRT, OR ABUSIVE CONDITIONS. OIL AND CLEAN EVERY 5-10 HOURS OPERATION.
DRIVE CHAINS, UNDER ENDURO, RACING OR EXTREMELY ABUSIVE CONDITIONS, SHOULD BE LUBED AND ADJUSTED EVERY 50-100 MILES OR AS REQUIRED.

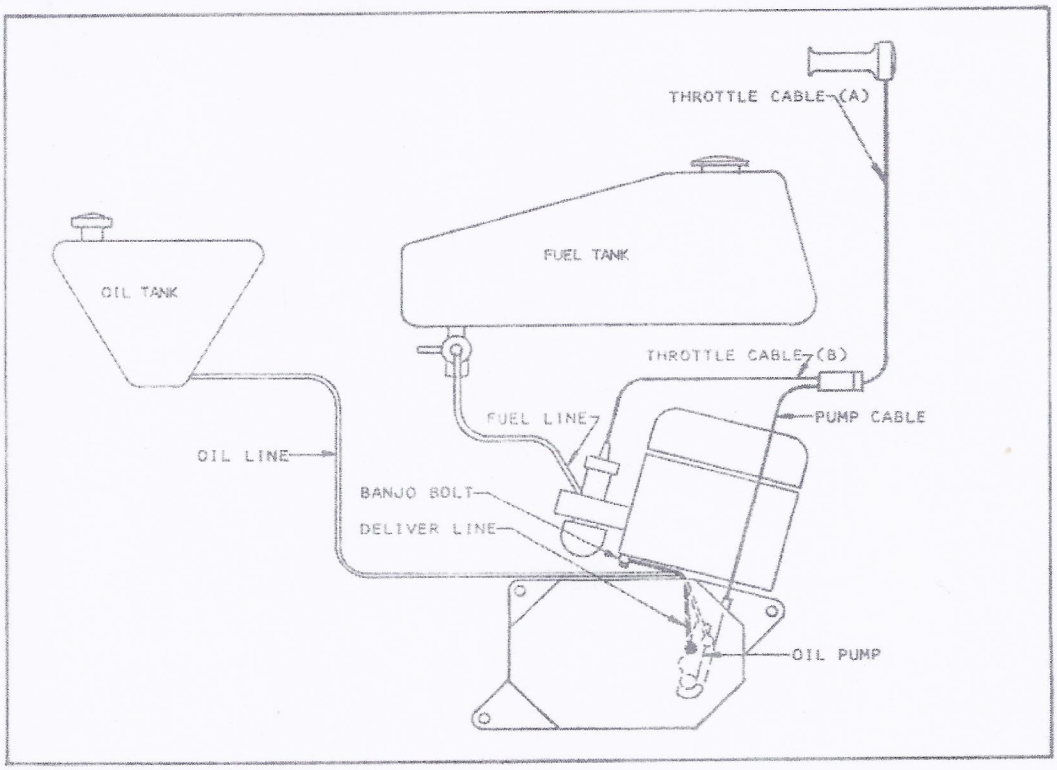
LUBRICATION CHART

ITEM	TYPE OF LUBRICANT
FRONT FORK OIL	30 WT. HYDRAULIC FORK OIL
TRANSMISSION OIL	30 WT. NON-DETERGENT OR ENG.GEAR LUBE
BRAKE CAM	90 WT. GREASE
ALL CONTROL & METER CABLES	GRAPHITE-BASE
BRAKE PEDAL SHAFT	90 WT. GREASE
ACCELERATOR GRIP	30 WT. MOTOR OIL
DRIVE CHAIN	90 WT. MOTOR OIL
SPEEDOMETER GEAR UNIT	90 WT. GREASE
SWINGARM SHAFT	90 WT. GREASE
GEAR SHIFT SHAFT	30 WT. MOTOR OIL
WHEEL BEARING	90 WT. WHEEL BEARING GREASE
SIDE STAND SHAFT	90 WT. GREASE
IGNITION POINT LUBE	30 WT. MOTOR OIL
STEERING BEARING RACES	90 WT. WHEEL BEARING GREASE
AIR FILTER	30 WT. MOTOR OIL

INDIAN AUTOLUBE SYSTEM

CONVENTIONAL 2-STROKE ENGINES ARE LUBRICATED BY OIL PRE-MIXED IN GASOLINE, BUT INDIAN'S AUTOLUBE FURNISHES AN AUTOMATIC, SEPARATE LUBRICATION SYSTEM. THAT IS, THE OIL IN A SEPARATE OIL TANK IS AUTOMATICALLY REGULATED BY THE OIL PUMP AND FED TO THE ENGINE ACCORDING TO ENGINE SPEED AND LOAD.

THE OIL PUMP IS DRIVEN BY THE ENGINE THROUGH A REDUCTION GEAR, AND IS CONNECTED TO THE CARBURETOR THROTTLE CABLE, WHICH IN TURN IS CONTROLLED BY THE ACCELERATOR GRIP. THE OIL PUMP AUTOMATICALLY REGULATES THE VOLUME OF LUBRICATING OIL ACCORDING TO ENGINE SPEED AND THROTTLE VALVE OPENING, THUS PUMPING THE PRECISE AMOUNT OF OIL FOR ENGINE LUBRICATION UNDER ANY OPERATING CONDITION.



THIS "AUTOMATIC, SEPARATE LUBRICATION" DOES NOT MERELY ELEMINATE DISADVANTAGES IN THE CONVENTIONAL PRE-MIX SYSTEM, BUT IT FURTHER IMPROVES THE PERFORMANCE AND EFFICIENCY OF 2-STROKE DESIGNS BY ELIMINATING CERTAIN OIL-STARVATION CONDITIONS WHICH FORMERLY EXISTED.

A) THE AUTOLUBE FEEDS AN OPTIMUM AMOUNT OF LUBRICATING OIL TO THE ENGINE UNDER ANY OPERATING CONDITION, THUS FEATURING:
- . LESS OIL CONSUMPTION
- . LESS CARBON ACCUMULATION
- . LESS EXHAUST SMOKE
- . IMPROVED LUBRICATING EFFICIENCY

B) THE AUTOLUBE SIMPLIFIES FUEL SUPPLY THUS FEATURING:
- . USING STRAIGHT GASOLINE DIRECTLY IN THE GAS TANK
- . LESS FUEL CONTAMINATION

C) THE AUTOLUBE IMPROVES THE RELIABILITY OF LUBRICATION, THUS ELIMINATING:
- . SPECIAL CARE CONCERNING OIL/FUEL MIXING RATIO

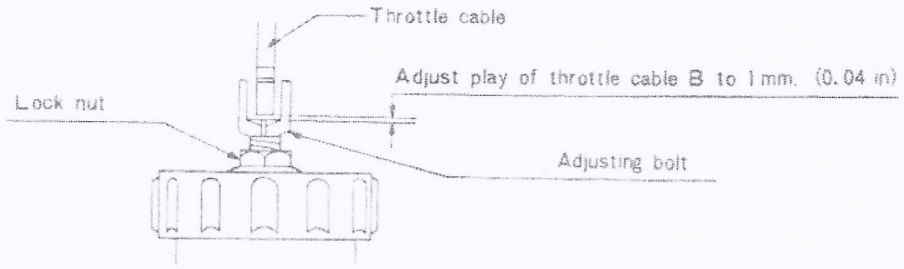
HANDLING THE OIL PUMP

THE OIL PUMP IS A PRECISION-MACHINED ASSEMBLY. MAKE NO ATTEMPT TO DISASSEMBLE IT. WHEN YOU REMOVE THE OIL PUMP FROM THE ENGINE, PROTECT IT FROM DUST, DIRT, ETC., AND AFTER REINSTALLING IT, BLEED AND ADJUST THE PUMP CORRECTLY. PROPER HANDLING WILL KEEP THE PUMP FREE FROM TROUBLE.

CARBURETOR AND AUTOLUBE CABLE ADJUSTMENTS

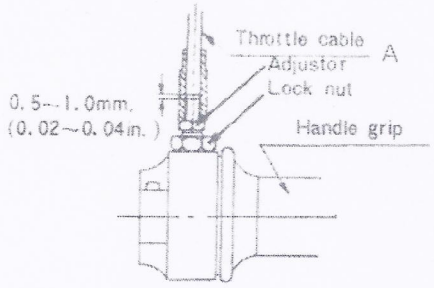
ADJUST THE CARBURETOR AND PUMP AS DESCRIBED IN THE STEPS BELOW.

1) THROTTLE CABLE ADJUSTMENT
A) ADJUST THE CARBURETOR WITH THE ENGINE AT IDLE, AND REMOVE ALL BUT 1MM OF SLACK FROM THROTTLE CABLE B.



TO BRING THE PLAY OF THE THROTTLE CABLE INTO CORRECT ADJUSTMENT, LOOSEN OR TIGHTEN THE THROTTLE CABLE ADJUSTMENT SCREW.
TO CHECK THIS ADJUSTMENT, LIGHTLY PULL THROTTLE CABLE B, AND ENGINE SPEED SHOULD SLIGHTLY INCREASE FROM IDLING R.P.M.

B) NEXT, ADJUST THROTTLE CABLE (A) SO THAT THE GAP(AS SHOWN IN FIGURE BELOW)WILL BE BETWEEN 0.5 AND 1.0MM (0.02 0.04IN.)



CHECK THE PLAY OF THE THROTTLE CABLE (A) BY PULLING THE OUTER PART OF THE CABLE. IF THE PLAY IS EXCESSIVE OR INSUFFICIENT, ADJUST THE PLAY WITH THE ADJUSTMENT SCREW.

LUBRICATE THE THROTTLE ASSEMBLY, THROTTLE CABLE, JUNCTION BOX AND OIL PUMP CABLE.

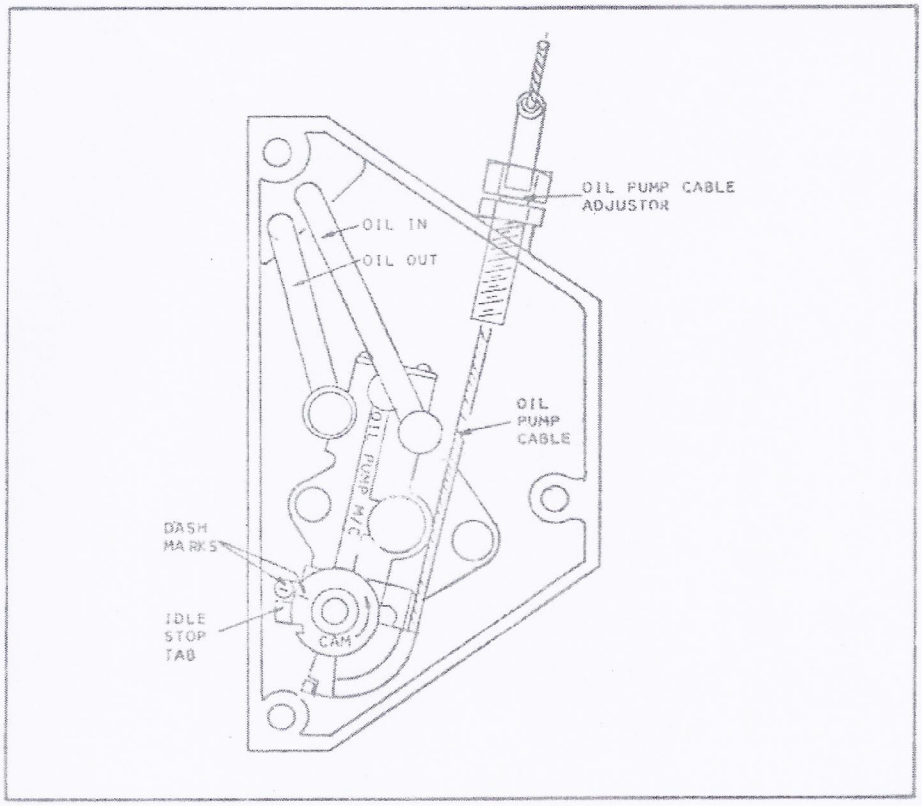
2) AUTOLUBE CABLE ADJUSTMENT

ADJUST THE PUMP CABLE SO THAT THE DASH MARK ON THE AUTOLUBE PUMP CAM IS ALIGNED WITH THE DASH MARK ON THE PUMP BODY (SEE FIGURE ON P.11 BEGIN BY FULLY CLOSING THE THROTTLE GRIP, THEN SLOWLY TURNING IT BACK AGAIN SO THAT THE SLACK IN THE THROTTLE CABLE IS COMPLETELY TAKEN UP. NEXT, ADJUST THE PUMP CABLE SO THAT THE MARKING ON THE PUMP CAM WILL BE ALIGNED WITH THE DASH MARK ON THE PUMP BODY, AS SHOWN IN FIGURE ON P.11 . THE POINT OF ADJUSTMENT IS AT THE END OF THE CABLE, JUST BEFORE IT ENTERS THE CASE. LOOSEN THE LOCK NUT AND SCREW THE ADJUSTER IN OR OUT, WHICHEVER DIRECTION IS NECESSARY TO OBTAIN THE CORRECT ADJUSTMENT.

ON NEW MOTORCYCLES OR WHEN THE PUMP HAS BEEN REMOVED OR THE AUTOLUBE OIL HAS RUN OUT, AIR WILL ENTER THE PUMP. THE AIR WILL CAUSE AN IRREGULAR FLOW OF OIL (AIR LOCK) AFTER THE PUMP IS MOUNTED AGAIN OR THE OIL TANK IS REFILLED. IN ORDER TO PREVENT SUCH AN IRREGULAR FLOW OF OIL, BLEED THE PUMP IN THE FOLLOWING MANNER:

BLEEDING PROCEDURE:

1. SERVICE THE MOTORCYCLE PER OWNERS MANUAL INSTRUCTIONS.
2. REMOVE THE OIL PUMP COVER.
3. FILL THE OIL TANK WITH ONE QUART OF OIL INJECTION TWO STROKE OIL. WE RECOMMEND THAT YOU USE GRAND PRIX INJUNOIL, 30 WEIGHT.
4. HOLD THE OIL PUMP CAM IN THE FULL "OPEN" POSITION AND START THE MOTORCYCLE. RUN THE ENGINE AT A LOW RPM WITH THE OIL PUMP WIDE OPEN. WATCH FOR THE OIL GOING THROUGH THE CLEAR OIL PUMP INLET LINE TO THE INLET MANIFOLD. CONTINUE TO HOLD THE PUMP WIDE OPEN UNTIL ALL OF THE AIR BUBBLES HAVE PASSED THROUGH THE OIL LINE (3-5 MINUTES).
5. WE RECOMMEND THAT THE FIRST TANK OF GAS BE PREMIXED AT A 40 TO 1 RATIO. THAT WILL HELP LUBRICATE THE ENGINE DURING THE FIRST FEW MINUTES OF RUNNING TIME.



RECOMMENDED OILS FOR INDIAN AUTOLUBE SYSTEM

FOR OPTIMUM PERFORMANCE OF THE AUTOLUBE SYSTEM, IT IS PREFERABLE TO USE OILS THAT ARE SPECIFICALLY DESIGNED FOR USE IN AIR-COOLED M/C ENGINES. THE VARIOUS TYPES OF OILS ACCEPTABLE FOR USE IN THE AUTOLUBE SYSTEM ARE LISTED BELOW IN THE ORDER OF PREFERENCE. THE OILS ARE LISTED IN THIS ORDER BECAUSE OF DIFFERENCES THAT THEY PRODUCE IN ENGINE LIFE UNDER EXTENDED PERIODS OF TIME AND MILEAGE, AND FOR THEIR DISPERSANT QUALITIES IN OUR ENGINES. THE TWO STROKE OILS HAVE ADDITIVES WHICH WILL NOT COLLECT AND FORM AS MUCH CARBON DEPOSIT AS AUTOMOTIVE ADDITIVES.

1) INJUNOIL, GRAND PRIX, 30 WT.
2) ANY MAJOR BRAND OF TWO STROKE OIL LABELED AS "BIA CERTIFIED FOR SERVICE TC-W".
3) ANY MAJOR BRAND OF OIL SPECIFICALLY DESIGNED FOR USE IN AIR-COOLED TWO STROKE ENGINES. THIS OIL SHOULD HAVE AN SAE RATING OF 30 WT AND IT SHOULD HAVE A RECOMMENDED MIXING RATIO OF 20:1.

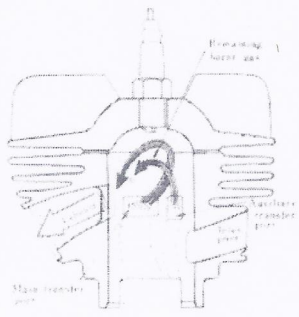
6 PORT CYLINDER INDUCTION SYSTEM

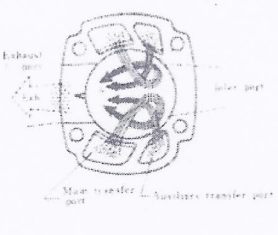
DESCRIPTION OF 6 PORT CYLINDER INDUCTION SYSTEM.
THE SCHNUERLE LOOP SCAVENGING SYSTEM IS THE MOST COMMONLY USED INDUCTION SYSTEM FOR THE TWO-STROKE ENGINES. IN THE SCHNUERLE LOOP SYSTEM TWO TRANSFER PORTS ON THE RIGHT AND LEFT SIDES OF THE CYLINDER ARE EMPLOYED TO TRANSFER 2 STREAMS OF FRESH FUEL IN THE LOOP DESIGN. THIS HAS PROVED TO BE THE MOST EFFECTIVE INDUSTION SYSTEM UNTIL THE INNOVATION OF INDIAN'S SIX PORT CYLINDER. THIS CONVENTIONAL SCHNUERLE LOOP SYSTEM HAD A DESIGN LIMIT IN THAT THE TRANSFER PORTS COULD NOT BE MADE LARGE ENOUGH TO COMPLETELY CLEAR THE COMBUSTION CHAMBER OF EXHAUST GASES BECAUSE OF THE POSITION OF THE INTAKE AND EXHAUST GAS REMAINING IN THE CENTRAL AREA OF THE COMBUSTION CHAMBER THAT WOULD CONTAMINATE THE FRESH FUEL CHARGE.

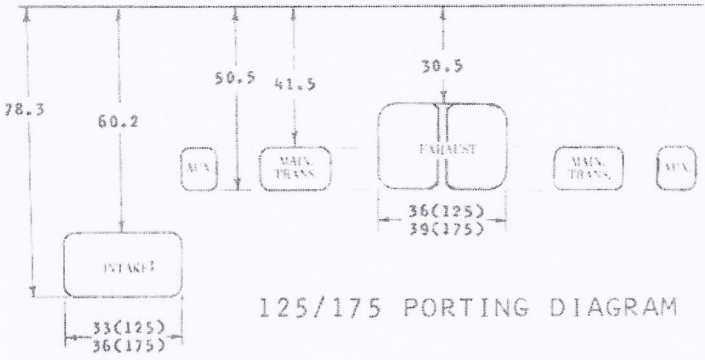
INDIAN'S RESEARCH AND ENGINEERING DEPARTMENTS, THEREFORE, DESIGNED AND PERFECTED THE SIX PORT CYLINDER INDUCTION SYSTEM THAT IS USED ON THE 125-175CC. THIS NEW SIX PORT SYSTEM, WITH THE INCORPORATION OF TWO ADDITIONAL SPECIALLY DESIGNED TRANSFER PORTS, COMPLETELY REMOVES ALL THE EXHAUST GASES PREVIOUSLY LEFT IN THE REAR AREA OF THE CYLINDER.

ENGINE PERFORMANCE IS GREATLY INCREASED WITH THE USE OF THIS SIX PORT SYSTEM.

CONSTRUCTION AND DESIGN OF THE SIX PORT INDUCTION SYSTEM.
THE 2 ADDITIONAL TRANSFER PASSAGES ARE PLACED IN THE IMMEDIATE REAR OF THE STANDARD TRANSFER PORTS. THESE TWO ADDITIONAL PORTS RUN FROM THE BOTTOM OF THE CYLINDER UP TO THE SAME HEIGHT AS THE STANDARD PORTS. THESE ADDITIONAL PORTS ARE DESIGNED TO DIRECT THE FRESH CHARGE AT THE AREA CONTAINING THE REMAINING EXHAUST GASES. AS THE FRESH FUEL CHARGE ENTERS THE COMBUSTION AREA, THE REMAINING EXHAUST GAS IS FORCED OUT THE EXHAUST PORT, THUS LEAVING THE COMBUSTION AREA WITH AN UNCONTAMINATED, FULL, FRESH FUEL CHARGE. THEREFORE, THESE ADDITIONAL TRANSFER PORTS PERFORM WITH EQUIVALENT EFFICIENCY THE TASK SO WELL DOME BY THE ADDITIONAL THIRD PORT OF THE ROTARY VALVE INDUCTION SYSTEM. THIS ASSURES CONSTANT AND EQUAL PERFORMANCE BOTH AT LOW ENGINE SPEEDS AND HIGH ENGINE SPEEDS.







125/175 PORTING DIAGRAM

THIS CHAPTER DESCRIBES THE DISASSEMBLY AND REASSEMBLY OF THE ENGINE, ITS REMOVAL FROM THE CHASSIS, AND THE NECESSARY SERVICE DATA. HOWEVER, EXCEPT WHEN OVERHAULING THE CRANKSHAFT ASSEMBLY, TRANSMISSION, SHIFTER MECHANISM, OR BEARINGS AND OIL SEALS IN THE CRANKCASE, IT IS SUGGESTED THAT ENGINE BE SERVICED WITHOUT REMOVING IT FROM THE CHASSIS. IT IS EASIER TO REMOVE AND/OR WORK ON THE MAGNETO ASSEMBLY, CYLINDER, CARBURATOR, OIL PUMP, CLUTCH, PRIMARY GEARS AND TRANSMISSION ADJUSTMENT WHILE THE ENGINE IS IN THE FRAME. IT IS ONLY NECESSARY TO REMOVE THE ENGINE COMPLETELY IF THE CRANKSHAFT OR TRANSMISSION NEED REPAIR WORK.

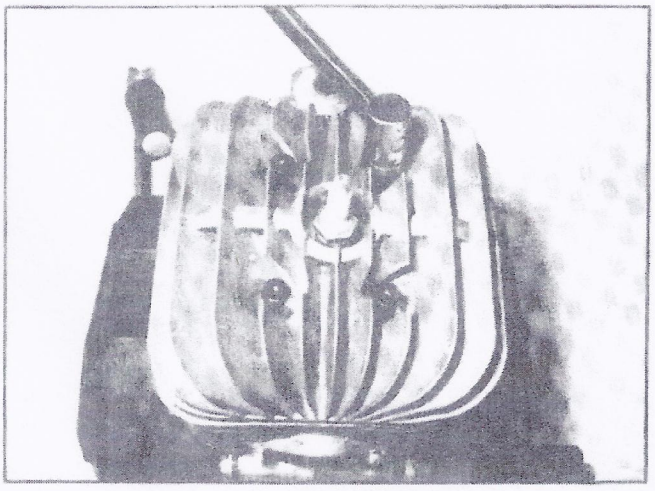
PREPARATION FOR DISASSEMBLY OF THE ENGINE:

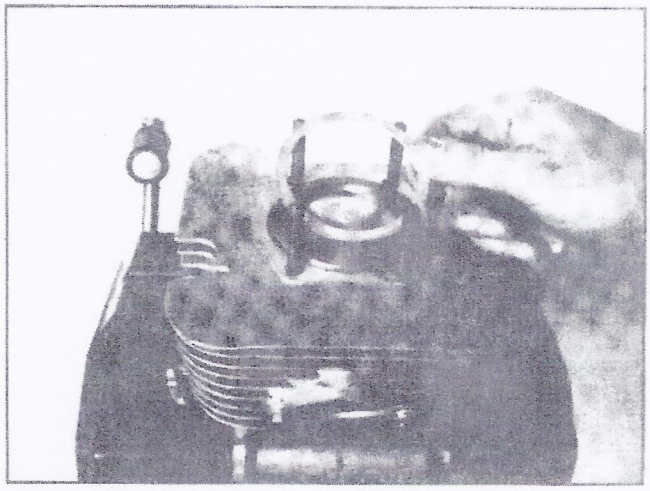
1) ALL DIRT, MUD, DUST, AND FOREIGN MATERIAL SHOULD BE THOROUGHLY REMOVED FROM THE EXTERIOR OF THE ENGINE ASSEMBLY BEFORE REMOVAL AND DISASSEMBLY. THIS WILL PREVENT ANY HARMFUL FOREIGN MATERIAL FROM ENTERING THE INTERIOR OF THE ENGINE ASSEMBLY.
2) BEFORE ENGINE REMOVAL AND DISASSEMBLY, BE SURE YOU HAVE PROPER TOOLS AND CLEANING EQUIPMENT SO YOU CAN PERFORM A CLEAN AND EFFICIENT JOB.
3) DURING ASSEMBLY OF THE ENGINE, CLEAN ALL PARTS AND PLACE THEM IN TRAYS IN ORDER OF DISASSEMBLE. THIS WILL MAKE ASSEMBLY TIME FASTER AND EASIER, AND INSURE CORRECT INSTALLATION OF ALL ENGINE PARTS.

CYLINDER HEAD

REMOVING
REMOVE THE FOUR NUTS FROM THE TOP OF THE CYLINDER HEAD, THEN THE HEAD AND GASKET. REVERSE THE SEQUENCE FOR REINSTALLATION. REPLACE THE GASKET.

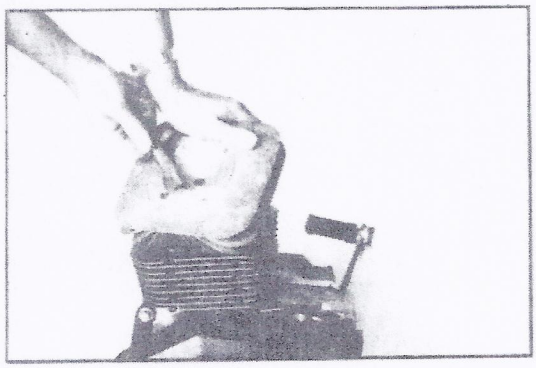
CYLINDER HEAD TIGHTENING TORQUE IS 25.3 - 28.9 FT-LBS (3.5-4.0 KG-M)





REMOVING CARBON DEPOSITS

CARBON DEPOSITS ON THE CYLINDER HEAD COMBUSTION CHAMBER AND TOP OF THE PISTON WILL RESULT IN AN INCREASE IN THE COMPRESSION RATIO, AS WELL AS PRE-IGNITION AND ENGINE OVERHEATING. SCRAPE THE CYLINDER HEAD AND PISTON DOME CLEAN.

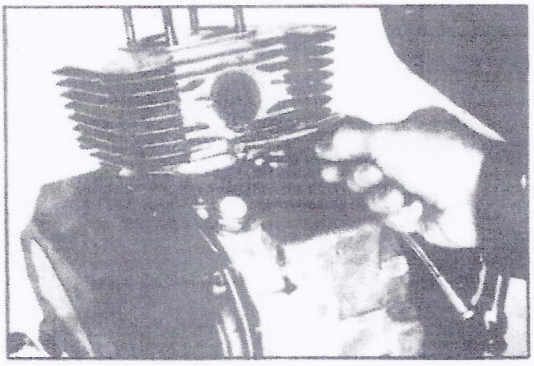


CYLINDER

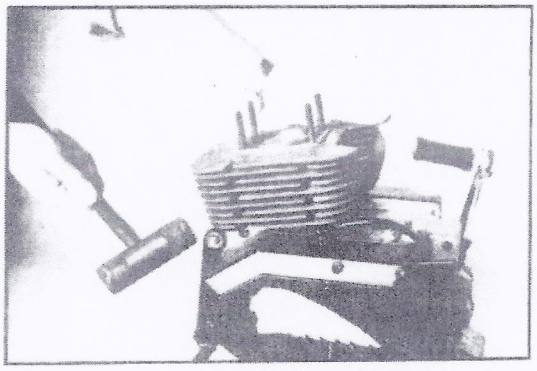
THE INDIAN I-125-175 ENGINE EMPLOYS AN ALUMINUM CYLINDER SLEEVED WITH SPECIAL CAST IRON, THAT PROVIDES IMPROVED COOLING EFFICIENCY AND LIGHT WEIGHT.
THE CYLINDER IS OF 6-PORT DESIGN WITH SUPERIOR SCAVENGING EFFICIENCY.

A)REMOVING THE CYLINDER

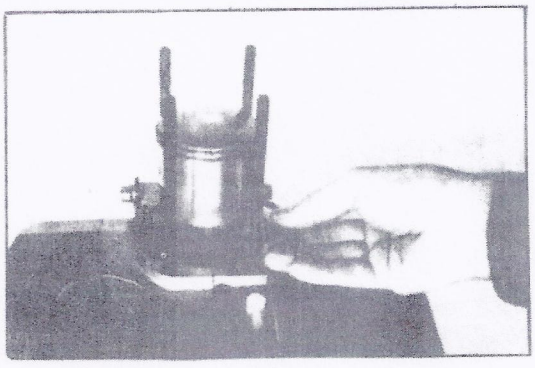
1)REMOVE THE OIL DELIVERY LINE BANJO BOLT FROM CYLINDER.



2)REMOVE THE CYLINDER BY STRIKING IT LIGHTLY WITH A PLASTIC OR RUBBER HAMMER.

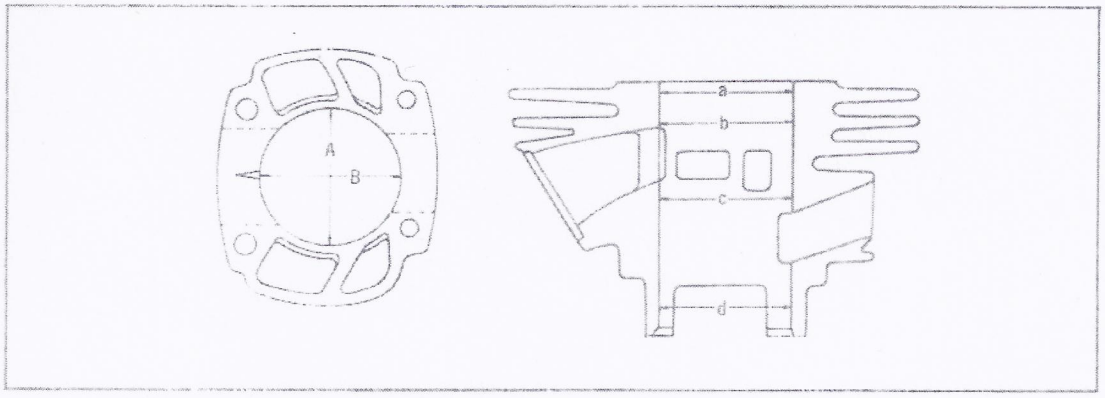


3)ALWAYS REPLACE THE CYLINDER BASE GASKET, WHEN REASSEMBLING.



B) CHECKING THE CYLINDER FOR WEAR

1)MEASURE THE AMOUNT OF WEAR OF THE CYLINDER WALL WITH A CYLINDER BORE MEASURING MICROMETER OR CYLINDER GAUGE. (MEASURE IT AT FOUR DEPTHS WHILE POSITIONING THE INSTRUMENT AT RIGHT ANGLES TO THE CRANKSHAFT). IF THE DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM DIAMETER EXCEEDS 0.05MM (0.0019"), REBORE AND HONE THE CYLINDER.



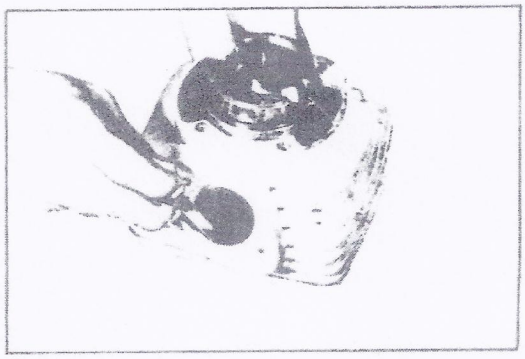
2)THE STANDARD CLEARANCE BETWEEN THE PISTON AND THE CYLINDER IS 0.040-0.045 MM (0.0016" AND 0.0018")

C) CYLINDER RECONDITIONING

1)PISTONS ARE AVAILABLE FOR THE I-125 ENGINE IN THE FOLLOWING SIZES: 55.96 (STD), 55.21 AND 56.46MM. FOR THE I-175 ENGINE THE PISTON SIZES ARE 65.96 (STD), 66.21 AND 66.46MM.
2)THE CYLINDER SHOULD BE REBORED AND HONED TO THE DIAMETER OF THE OVERSIZE PISTON PLUS THE STANDARD ALLOWABLE CLEARANCE.
3)THE ERROR BETWEEN THE MAXIMUM AND MINIMUM DIAMETERS AFTER HONING SHOULD BE NO MORE THAN 0.04MM (0.0015").

D) REMOVING CARBON DEPOSITS

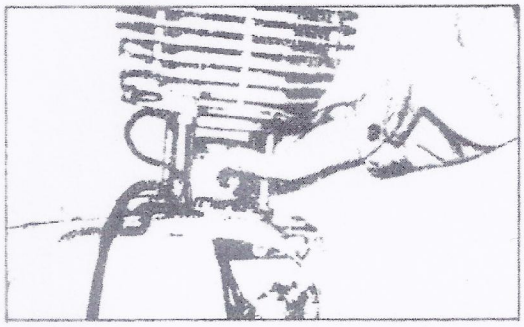
SCRAPE OFF THE CARBON ACCUMULATION IN THE EXHAUST PORT OF THE CYLINDER WITH A KNIFE.



E) INSTALLING THE CYLINDER

PUT YOUR FINGERS AT EACH END OF THE PISTON RING, EXPAND THE RING, AND SLIP IT ONTO THE PISTON. ALIGN BOTH ENDS OF THE RING WITH THE LOCATING PIN IN EACH RING GROOVE.

NEXT, INSERT THE PISTON INTO THE CYLINDER. TAKE CARE NOT TO DAMAGE THE RINGS ON THE BOTTOM OF THE CYLINDER.



PISTON PIN

A) PULLING OUT THE PISTON PIN

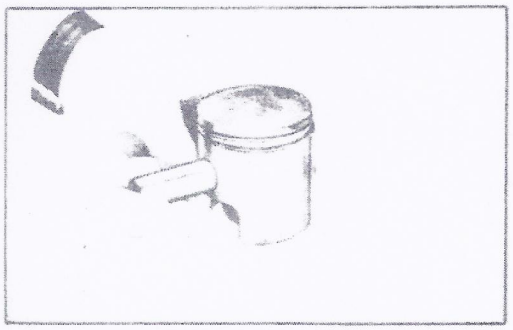
REMOVE THE CLIP AT THE END OF THE PISTON PIN WITH NEEDLE NOSE PLIERS, AND PRESS OUT THE PISTON PIN WITH A FINGER OR A SLOT-HEAD SCREWDRIVER.

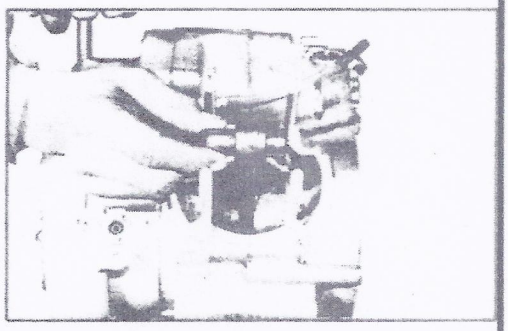
NOTE:
BEFORE REMOVING THE PISTON PIN CLIPS, COVER THE CRANKCASE WITH A CLEAN RAG, SO YOU WILL NOT ACCIDENTALLY DROP THE CLIP OR OTHER FOREIGN PARTICLES INTO THE CRANKCASE.

B) PISTON-TO-PISTON PIN FIT

THE PISTON PIN SHOULD FIT SNUGLY IN ITS BORE SO THAT IT DRAGS A LITTLE AS YOU TURN IT. IF THE PISTON PIN IS LOOSE, REPLACE THE PIN AND/OR THE PISTON.

IF THE CENTER OF THE PIN IS STEP-WORN, REPLACE THE NEEDLE BEARING AS WELL AS THE PISTON PIN. CHECK THE SMALL END OF THE CONNECTING ROD FOR WEAR BY INSERTING THE PISTON PIN AND BEARING.

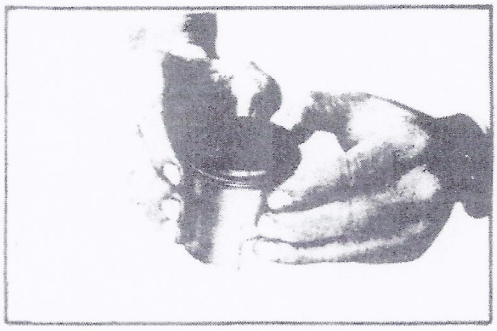


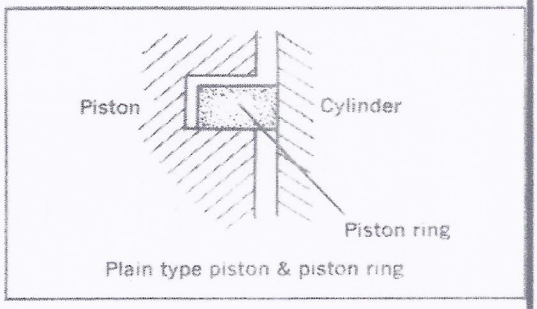


PISTON RING

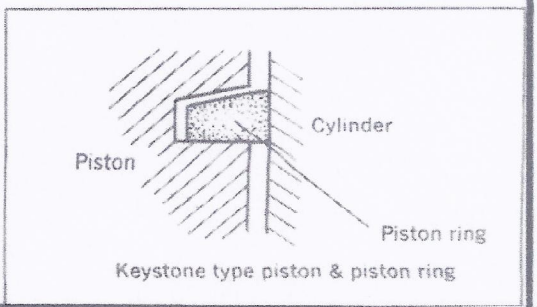
C) REMOVING THE PISTON RINGS

PUT YOUR THUMBS AT EACH END OF THE PISTON RING AND PULL THE PISTON RING ENDS APART. REMOVE THE RING BY MOVING THE RING OFF THE PISTON ON THE OTHER SIDE OF THE RING ENDS.





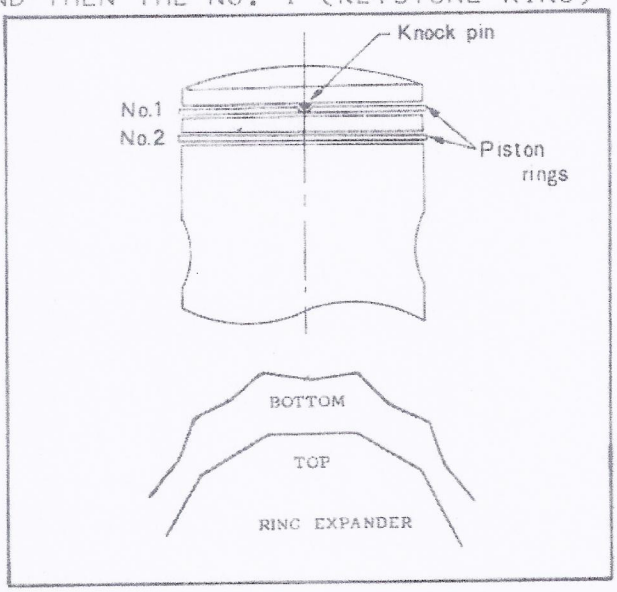
Plain type piston & piston ring



Keystone type piston & piston ring

INSTALLING THE PISTON RINGS

FIRST FIT NO. 2 RING OVER THE PISTON, AND THEN THE NO. 1 (KEYSTONE RING) AND ALIGN THEIR END GAPS WITH THE LOCATING PIN IN EACH RING GROOVE. THE PRINTING ON ALL RINGS MUST FACE UP TO POSITION THE GAP PROPERLY AT THE PIN.



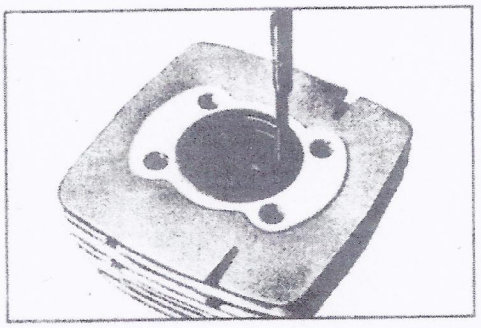
PISTON RING EXPANDER

PISTON RING EXPANDERS ARE SOMETIMES USED TO INCREASE CONTACT PRESSURE BETWEEN PISTON RING AND CYLINDER WALL. IN CASES WHERE EXPANDERS ARE USED, THE EXPANDER WITH THE DOUBLE BEND IS ON THE BOTTOM. SEE DRAWING BELOW.

CHECKING THE PISTON RINGS

1)MEASURE THE PISTON RING WEAR.
PUT THE RING INTO THE CYLINDER SO THAT THE RING IS PARALLEL TO THE CYLINDER BOTTOM EDGE, AND THEN MEASURE THE END GAP WITH A FEELER GAUGE.

END GAP
0.15-0.35MM(BOTH NO. 1 & NO. 2)



2)REMOVING CARBON
CARBON ON THE PISTON RINGS AND IN THE RINGS GROOVES WILL MAKE THE RINGS STICK IN THE PISTON, THUS CAUSING GAS BLOW-BY.

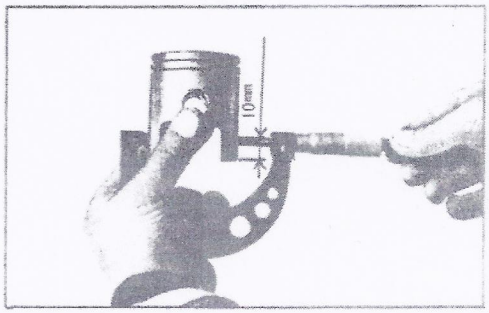
REMOVE THE RINGS FROM THE PISTON, AND CLEAN THE CARBON FROM THE RING GROOVES.

PISTON

THE PISTON IS MADE OF A HIGH-SILICON ALUMINUM ALLOY.

CHECKING AND CORRECTING THE PISTON-TO-CYLINDER WALL CLEARANCE

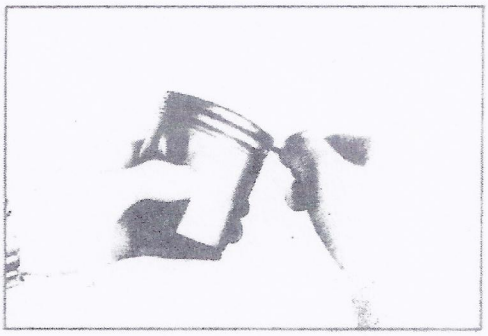
1) MEASURING PISTON CLEARANCE
PISTON CLEARANCE IS THE DIFFERENCE BETWEEN THE MINIMUM CYLINDER BORE DIAMETER AND THE MAXIMUM OUTSIDE DIAMETER OF THE PISTON. AS DESCRIBED, CYLINDER, PISTON CLEARANCE SHOULD BE 0.040-0.045MM (0.0016-0.0018")



TO DETERMINE THE MAXIMUM PISTON DIAMETER, MEASURE THE PISTON WITH A MICROMETER AT RIGHT ANGLES TO THE SKIRT 10MM (3/8") FROM ITS BOTTOM EDGE.

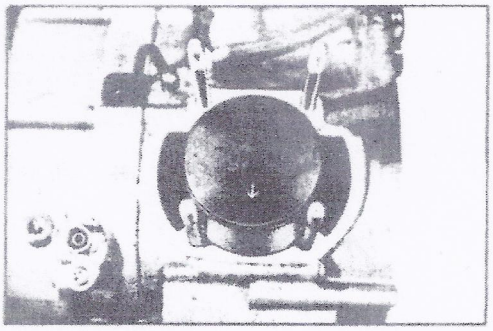
2) CHECKING AND CORRECTING SCRATCHES ON THE PISTON.
A PISTON SHOWING SIGNS OF SEIZURE WILL RESULT IN NOISE AND LOSS OF ENGINE POWER. IT WILL ALSO CAUSE DAMAGE TO THE CYLINDER WALL.
IF A PISTON THAT HAS SEIZED IS USED AGAIN WITHOUT CORRECTION, ANOTHER SEIZURE WILL DEVELOP IN THE SAME AREA. LIGHTLY SAND THE SEIZURE"HIGH SPOT" ON THE PISTON WITH #400 SANDPAPER UNTIL SMOOTH.

3) REMOVING CARBON
REMOVE CARBON ACCUMULATION ON THE PISTON CROWN USING A KNIFE. CARBON AND GUM ACCUMULATIONS IN THE PISTON GROOVE WILL RESULT IN PISTON RING SEIZURE. REMOVE THEM FROM THE RING GROOVES.



PISTON INSTALLATION DIRECTION

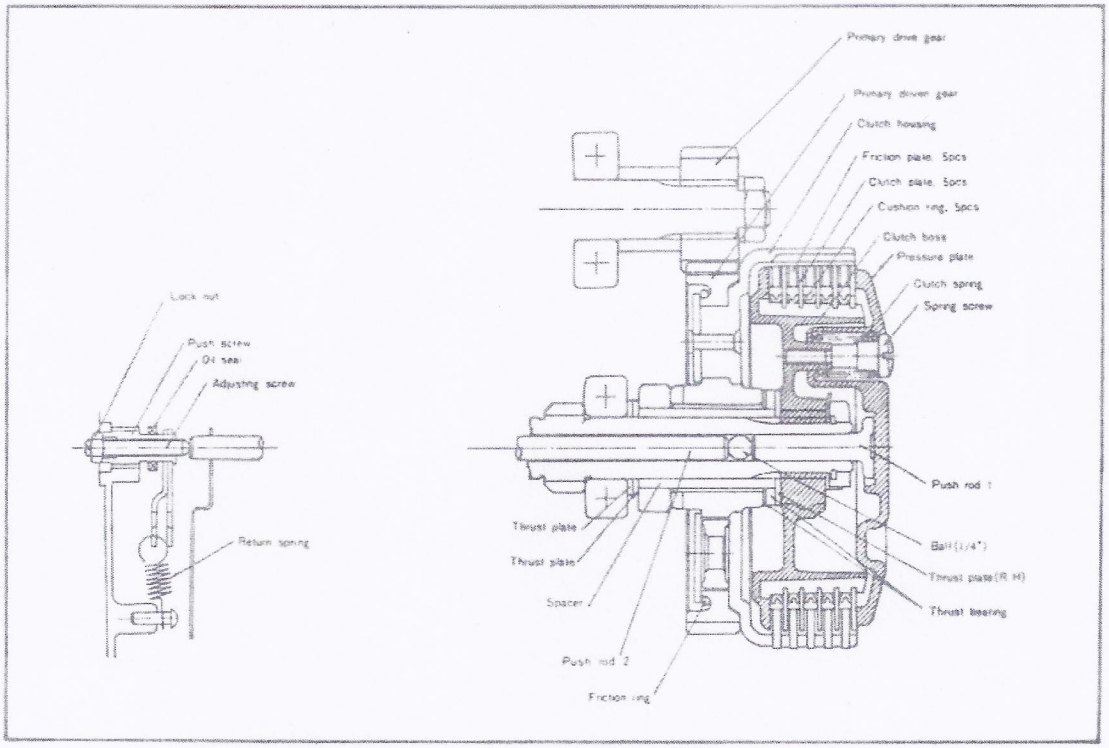
INSTALL THE PISTON WITH THE ARROW MARK ON THE HEAD POINTING FORWARD (TOWARD THE EXHAUST PORT OF THE CYLINDER.)



CLUTCH

THE CLUTCH IS A WET, MULTI-DISC TYPE, CONSISTING OF FIVE MOLDED CORK FRICTION PLATES AND FIVE CLUTCH PLATES IN THE CLUTCH HOUSING THAT IS MOUNTED ON THE TRANSMISSION MAIN AXLE. TO DISENGAGE THE CLUTCH, AN INNER PUSH ROD SYSTEM IS EMPLOYED. THE PRIMARY DRIVEN GEAR, COUPLED WITH THE CLUTCH HOUSING, IS MESHED WITH A KICK PINION GEAR. THIS ALLOWS THE KICK STARTER TO BE OPERATED WITH THE CLUTCH DISENGAGED OR ENGAGED.

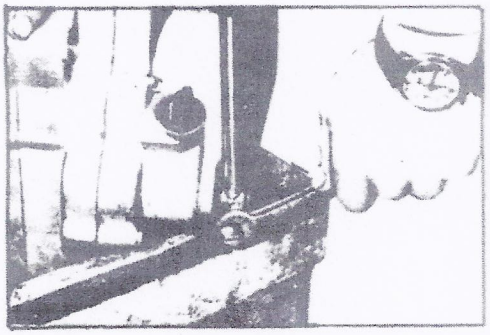
A SHOCK ABSORBER CONSISTING OF RUBBERS IS BETWEEN THE PRIMARY DRIVEN GEAR AND THE CLUTCH HOUSING.
THE PRIMARY DRIVE GEAR HAS 19 TEETH, AND THE PRIMARY DRIVEN GEAR 74 TEETH.
(PRIMARY REDUCTION RATIO. . . . . 74/19=3.894)



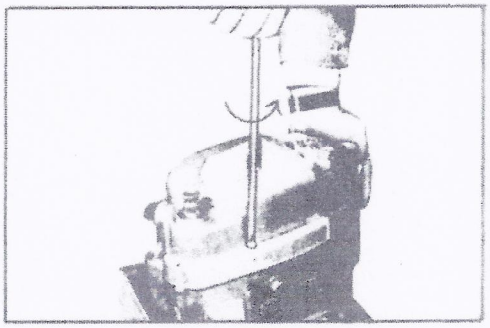
CRANKCASE COVER (R.H.)

A) REMOVAL

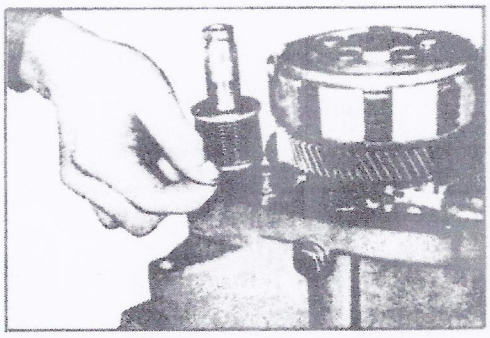
1) REMOVE THE KICK CRANK MOUNTING BOLT AND THE CRANK.



2) REMOVE THE ALLEN HEAD SCREWS HOLDING THE CRANKCASE COVER, AND THEN REMOVE THE CASE COVER. (THE COVER CAN BE REMOVED WITHOUT TAKING OFF THE OIL PUMP)



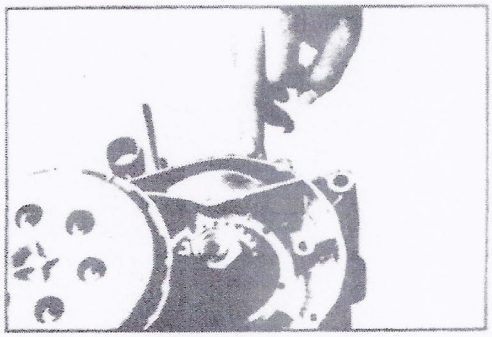
3) REMOVE THE CRANKCASE COVER GASKET. REPLACE IT, IF DAMAGED.

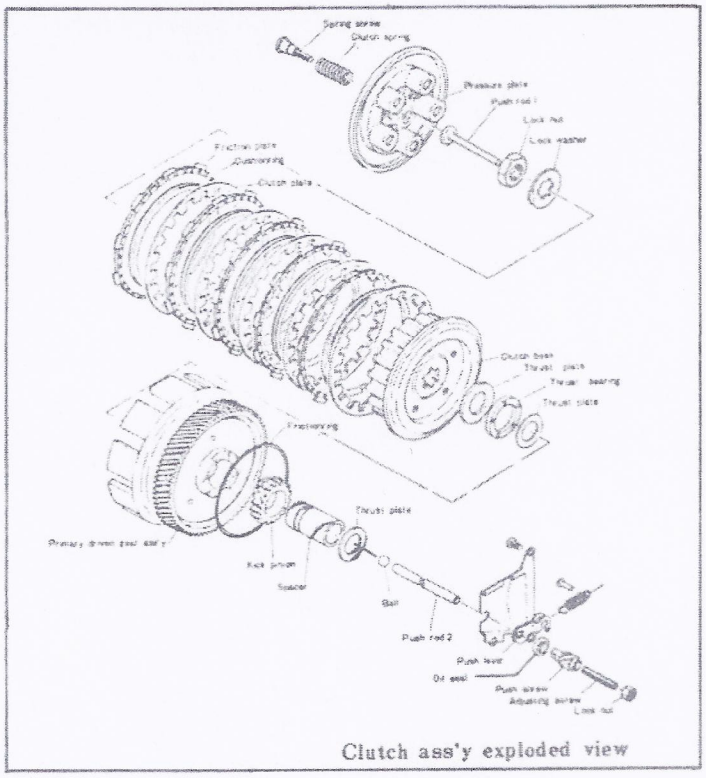


INSTALLATION

SPREAD GASKET CEMENT OVER THE MATING SURFACE OF CRANKCASE (R). PLACE THE CRANKCASE COVER GASKET ON THE CRANKCASE AND APPLY GASKET CEMENT AND REPLACE CRANKCASE COVER (R). BE SURE TO APPLY GASKET CEMENT TO THE MATING SURFACE; OTHERWISE OIL WILL LEAK.

NOTE: WHEN INSTALLING THE CRANKCASE COVER (R), MAKE SURE THAT THE PUMP DRIVE GEAR (MADE FROM PLASTIC) IS CORRECTLY ENGAGED WITH THE PRIMARY DRIVE GEAR.

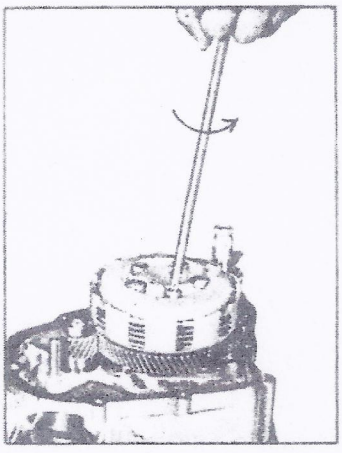


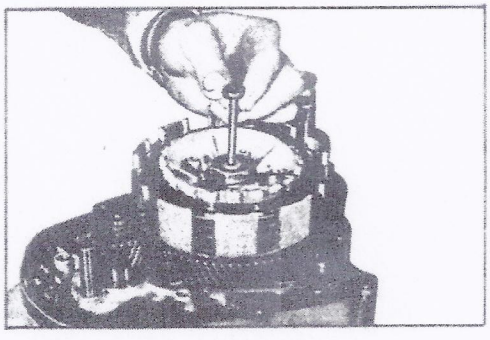


Clutch ass'y exploded view

REMOVING THE PRESSURE PLATE

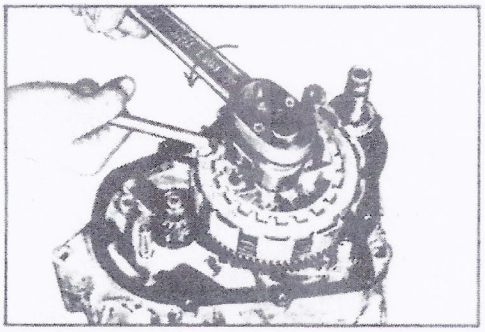
REMOVING THE FIVE CLUTCH SPRING HOLDING SCREWS, AND TAKE OUT THE PRESSURE PLATE AND PUSH ROD #1.





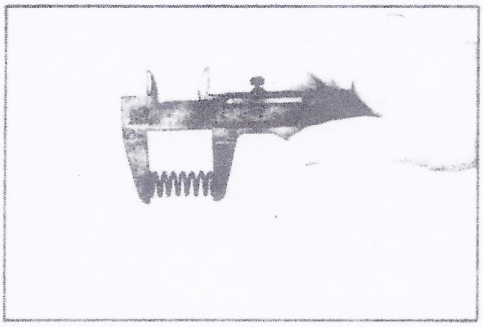
REMOVING THE CLUTCH BOSS

INSTALL THE CLUTCH HOLDING TOOL ON THE CLUTCH BOSS. LOOSEN THE LOCK NUT, AND THEN REMOVE THE CLUTCH BOSS.



B) CHECKING THE CLUTCH SPRING

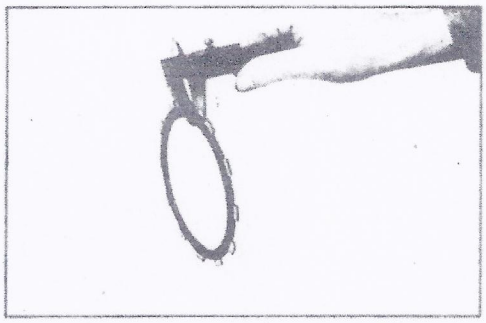
IF THE FREE LENGTH OF THE SPRING IS 1MM (0.04") OR MORE SHORTER THAN THE STANDARD FREE LENGTH, REPLACE IT.



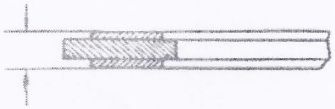
FREE LENGTH 31.5MM (1.240")

C) CHECKING THE FRICTION PLATES

INSPECT THE FRICTION PLATES FOR WEAR. REPLACE THEM IF THEY SHOW 0.4MM (0.157") OR UNEVEN CONTACT.



STANDARD THICKNESS IS 4.06MM (.160").
THE MINIMUM THICKNESS IS 4.0MM

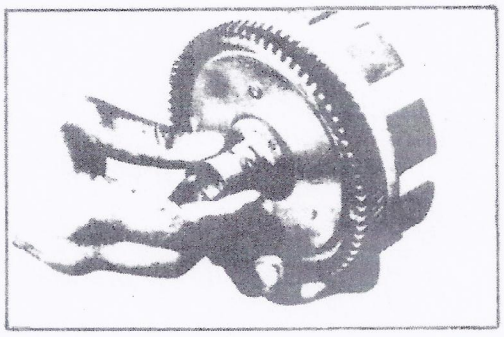


CLUTCH HOUSING ASSEMBLY (INTEGRATED WITH THE PRIMARY DRIVEN GEAR)

THERE IS A RUBBER FRICTION RING PLACED ON THE OUTSIDE OF THE CLUTCH BETWEEN THE PRIMARY DRIVEN GEAR AND THE CLUTCH HOUSING IN ORDER TO REDUCE GEAR NOISE AT LOW ENGINE SPEEDS.

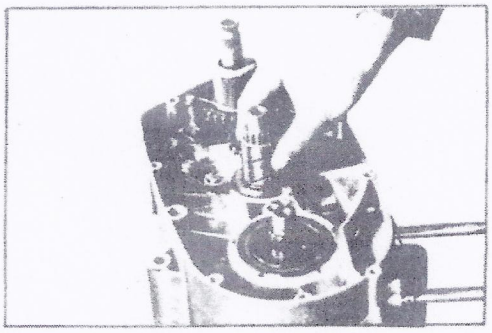
D) INSPECTION

INSERT THE PRIMARY GEAR RETAINING COLLAR (SPACER) IN THE PRIMARY DRIVEN GEAR BOSS AND CHECK IT FOR RADIAL PLAY. IF THE PLAY IS EXCESSIVE, REPLACE THE GEAR RETAINING COLLAR BECAUSE IT WILL CAUSE EXCESSIVE NOISE.
IF ANY SCRATCHES ARE FOUND, REPLACE THE SPACER TO AVOID IMPAIRED CLUTCH ACTION.



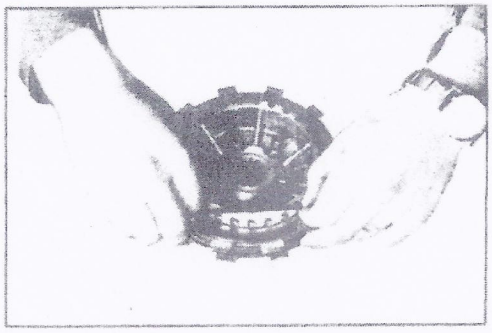
CHECKING THE PRIMARY GEAR RETAINING COLLAR (SPACER)

PLACE THE PRIMARY GEAR RETAINING COLLAR AROUND THE MAIN AXLE AND AGAIN CHECK IT FOR RADIAL PLAY. IF PLAY EXISTS, REPLACE THE GEAR RETAINING COLLAR.
REPLACE ANY COLLAR WITH STEP-WEAR ON ITS OUTER SURFACE.



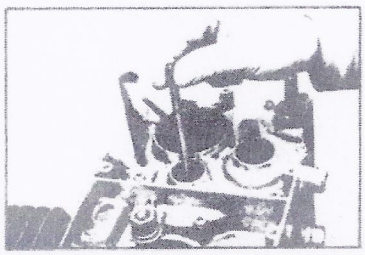
FITTING CUSHION RINGS

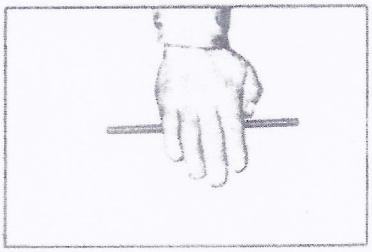
A CUSHION RING IS INSTALLED BETWEEN THE CLUTCH BOSS AND EACH OF THE FRICTION PLATES TO INSURE EVEN ENGAGEMENT AND COMPLETE DISENGAGEMENT OF THE PLATES. WHEN FITTING CUSHION RINGS, BE SURE THEY ARE FLAT AND NOT TWISTED.



E) CHECKING THE PUSH ROD

REMOVE THE PUSH ROD #2 AND ROLL IT OVER A SURFACE PLATE. IF THE ROD IS BENT, REPLACE IT.



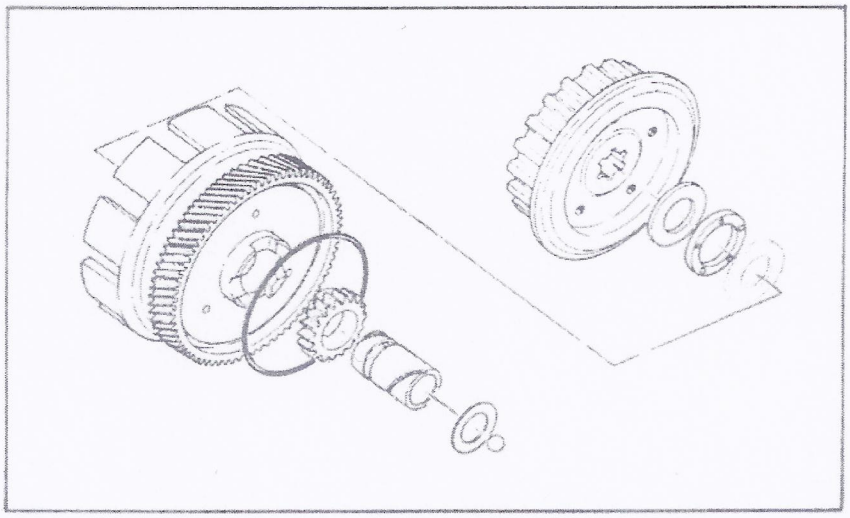


CAUTION ON RE-ASSEMBLING THE CLUTCH

*ON BOTH ENDS OF THE PRIMARY GEAR SPACER ARE THRUST WASHERS AND THRUST BEARING. IF THESE WASHERS AND BEARING ARE INCORRECTLY INSTALLED, OR OMITTED, THE CLUTCH BOSS WILL RUB DIRECT-ON THE PRIMARY DRIVEN GEAR, IMPAIRING CLUTCH ACTION.

*THE THRUST BEARING FITS ON THE PRIMARY RETAINING COLLAR, BUT IT MAY SLIP OUT OF PLACE WHEN INSTALLING CLUTCH BOSS. THEREFORE, APPLY GREASE TO BOTH SURFACES OF THE BEARING TO MAKE IT STICK TO THE GEAR RETAINING COLLAR.

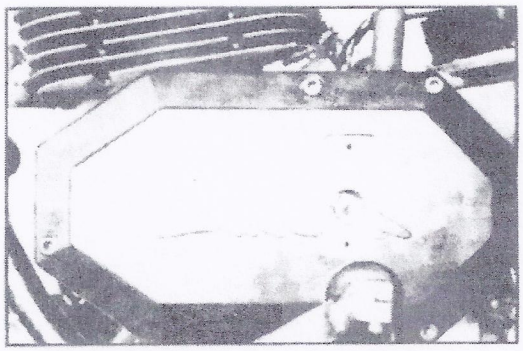
BEFORE FITTING THE CLUTCH BOSS, INSTALL THE CLUTCH PLATES, FRICTION PLATES, ETC., AND THEN INSTALL THE CLUTCH BOSS.



ADJUSTING THE CLUTCH

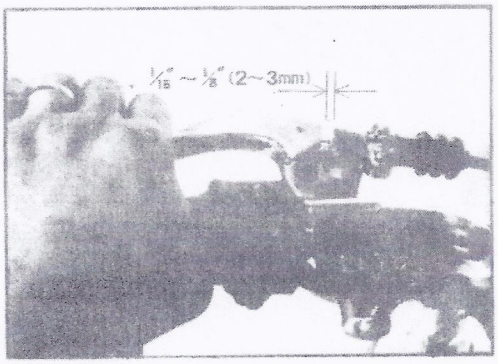
1) SETTING THE ADJUSTING SCREW

TURN THE ADJUSTING SCREW IN UNTIL IT LIGHTLY SEATS AGAINST THE PUSH ROD.
NEXT, BACK THE SCREW OFF 1/4 TURN TO GET THE PROPER SPACING, THEN TIGHTEN THE LOCK NUT.



2) ADJUSTING THE CLUTCH CABLE TENSION
THE CLUTCH CABLE BECOMES SLACKENED AFTER BEING USED FOR A LONG TIME. OCCASIONALLY THE CABLE MUST BE ADJUSTED SO THAT THE PLAY AT THE CLUTCH HANDLE IS FROM 2 TO 3MM. (1/16-1/8")

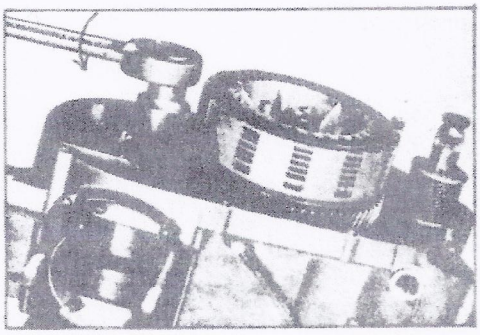
NOTE:
ENGINE MUST BE AT OPERATING TEMPERATURE WHEN ADJUSTING THE CLUTCH.

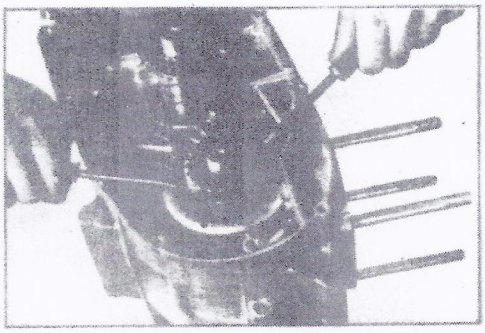


PRIMARY DRIVE GEAR

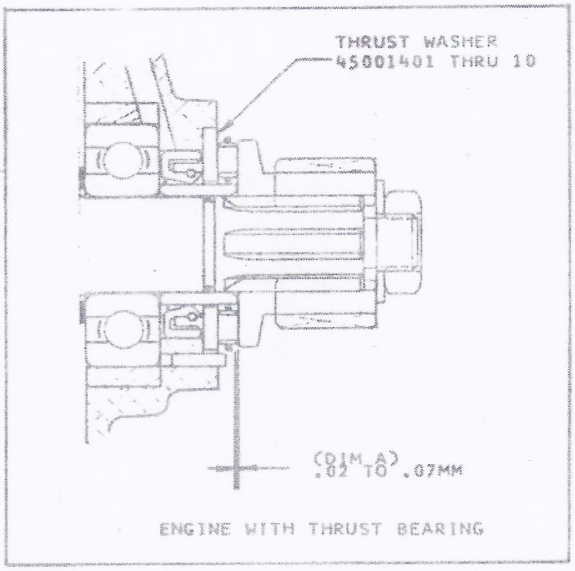
A) REMOVAL

FEED A ROLLED-UP RAG BETWEEN THE TEETH OF THE PRIMARY DRIVE GEAR AND THE PRIMARY DRIVEN GEAR TO LOCK THEM, AND LOOSEN THE PRIMARY DRIVE GEAR LOCK NUT. THE PRIMARY GEAR CAN THEN BE FORCED OFF BY USING TWO SCREWDRIVERS.





B) THRUST BEARING ADJUSTMENT
WHEN REASSEMBLING MODELS EQUIPPED WITH A THRUST BEARING, CHECK DIMENSION "A" WITH A FEELER GAUGE TO ENSURE THAT THE BEARING CLEARANCE IS .02 - .07MM (.001 - .003"). SHOULD ADJUSTMENT BE NECESSARY, SELECT THE CORRECT THRUST WASHER P/N 45001401-10 TO GIVE THE REQUIRED CLEARANCE.
SEE ALSO PAGE 41



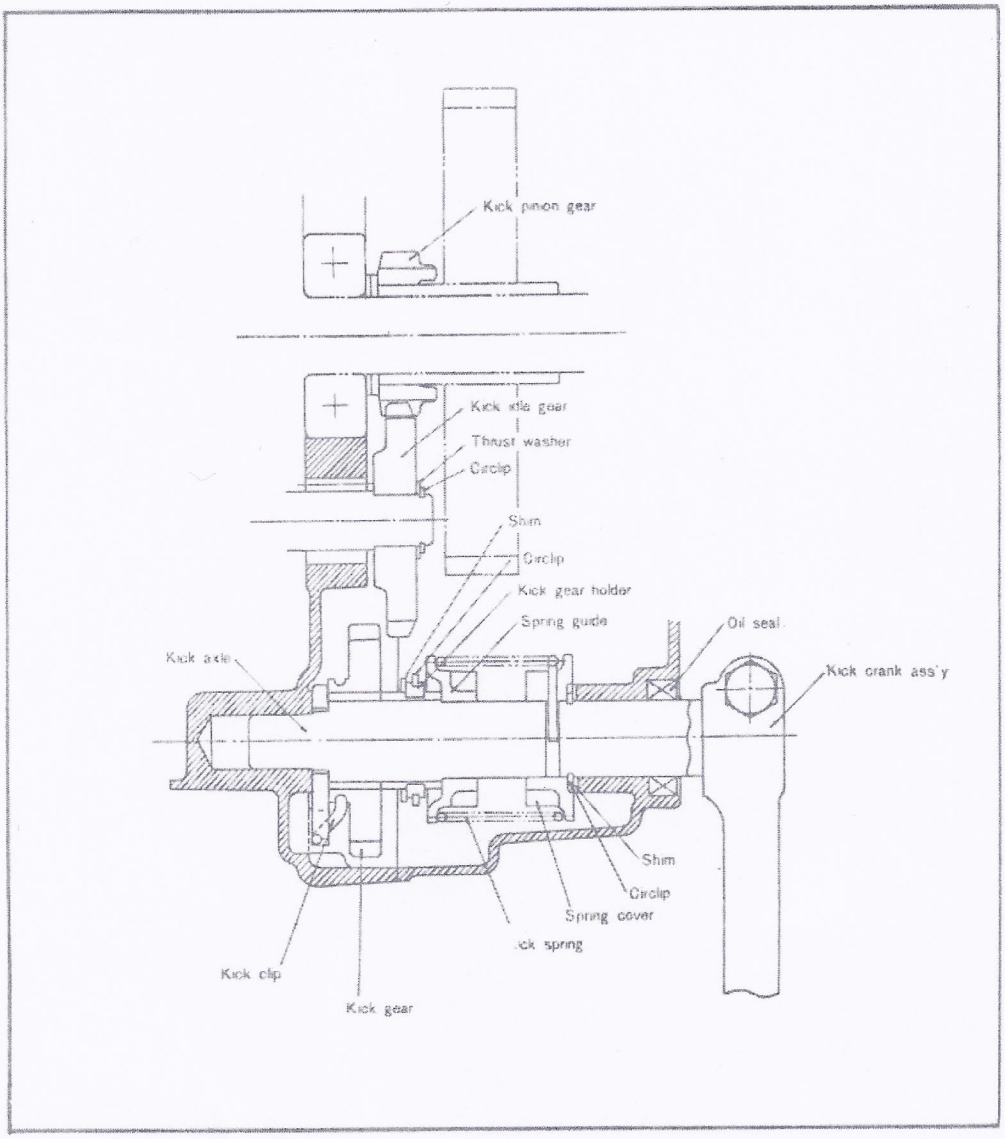
ENGINE WITH THRUST BEARING

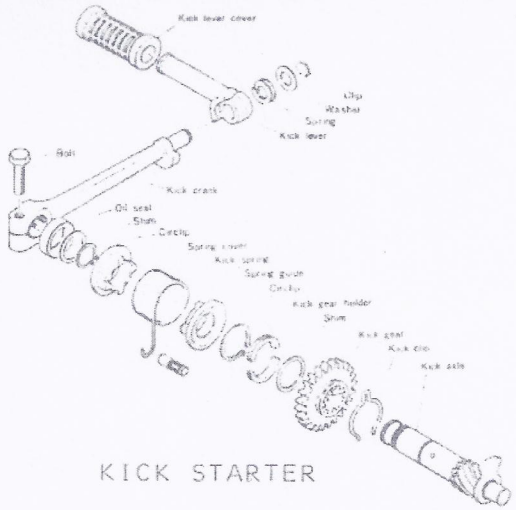
KICK STARTER MECHANISM

THE PRIMARY KICK-STARTER SYSTEM IS EMPLOYED. HOWEVER, A NEW "NON-CONSTANT MESH" MECHANISM HAS BEEN INTRODUCED, INSTEAD OF THE CONSTANT-MESH KICK GEAR TYPE, SUCH AS THE RATCHET AND ROLLER-LOCK SYSTEMS.

THAT IS, THE KICK GEAR MESHES WITH IDLER GEAR ONLY WHEN THE KICK STARTER PEDAL IS KICKED. AFTER THE ENGINE HAS STARTED, THE KICK GEAR AND THE IDLER GEAR DISENGAGE.

THIS MECHANISM NOT ONLY ELIMINATES NOISE RESULTING FROM THE CONSTANT MESH OF THE KICK GEAR WITH THE IDLER GEAR, BUT ALSO GREATLY CONTRIBUTES TO THE DURABILITY OF THE KICK STARTER ASSEMBLY.

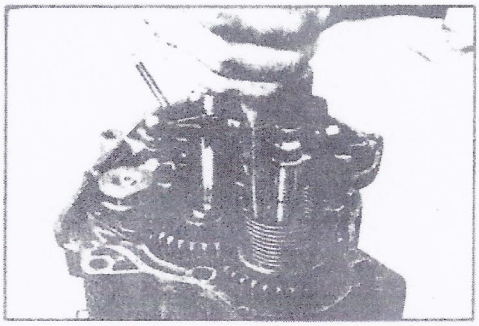




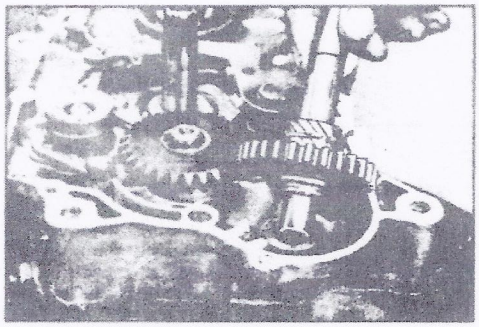
KICK STARTER

A) REMOVAL

1)REMOVE THE KICK SPRING

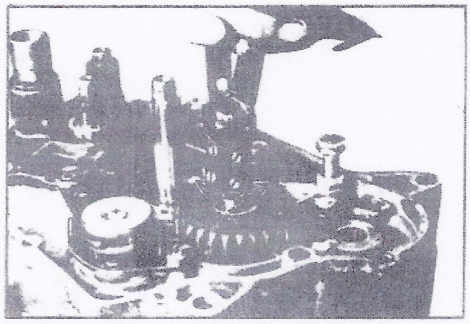


2)THEN REMOVE THE KICK STARTER ASSEMBLY.



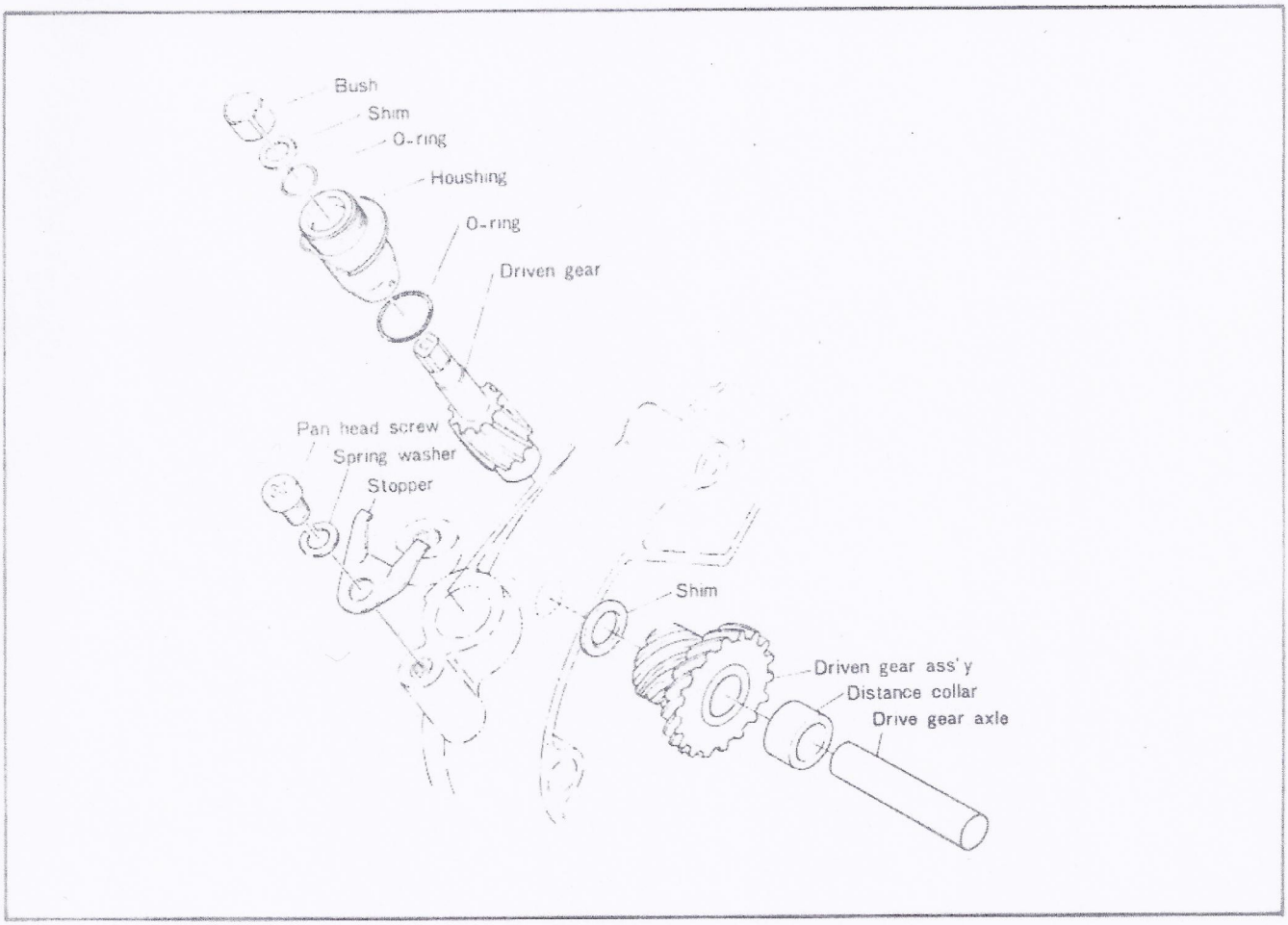
B) REMOVING THE KICK IDLER GEAR

REMOVE THE CIRCLIP WITH CLIP PLIERS. THEN THE KICK IDLER GEAR CAN BE EASILY REMOVED.



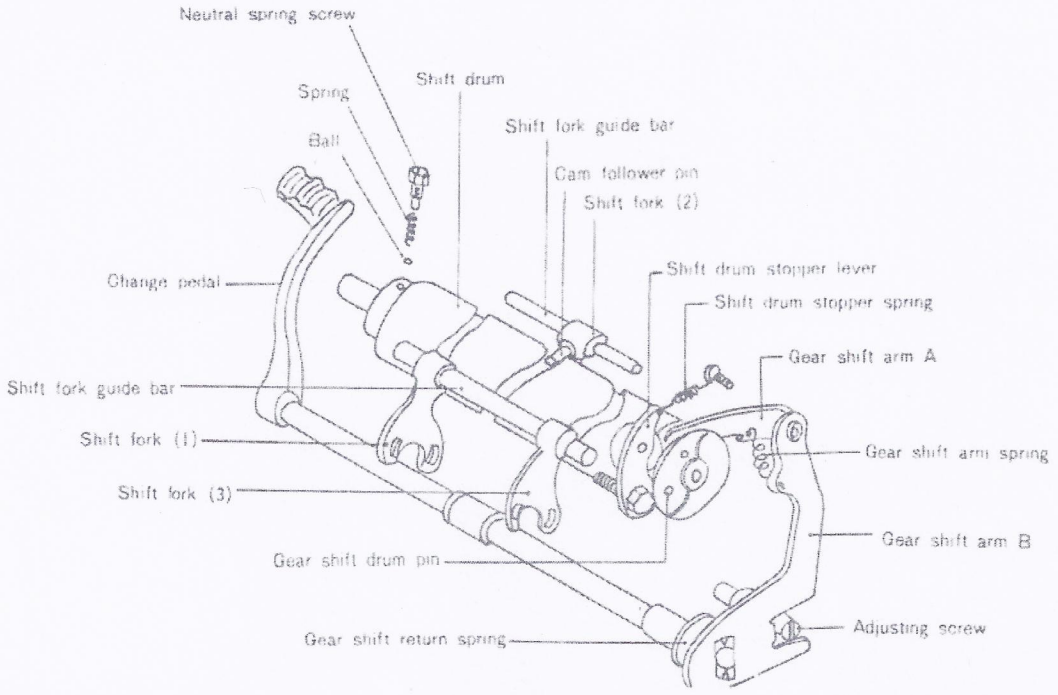
TACHOMETER GEAR UNITS

THE TACHOMETER DRIVE GEAR IS ENGAGED WITH THE PRIMARY DRIVE GEAR TO CONVEY THE REVOLUTIONS PER MINUTE OF THE CRANKSHAFT TO THE TACHOMETER THROUGH THE TACHOMETER CABLE.



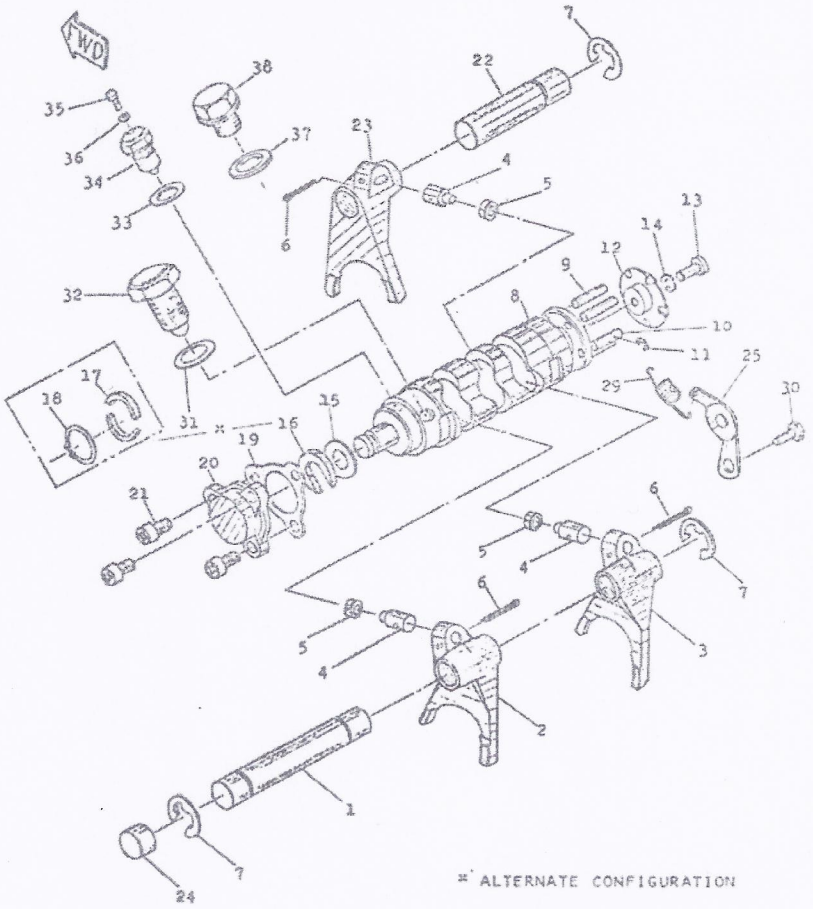
SHIFT MECHANISM

THE I-125, I-175 SHIFT MECHANISM ARE OPERATED IN FIVE STAGES BY A SEE-SAW TYPE CHANGE PEDAL. AS THE CHANGE PEDAL IS DEPRESSED, GEAR SHIFT ARM B MOVES GEAR SHIFT ARM A, WHICH IN TURN PUSHES ON ONE OF THE GEAR SHIFT PINS ATTACHED TO THE GEAR SHIFT DRUM, THEREBY TURNING THE GEAR SHIFT DRUM. A TOTAL OF FIVE GEAR SHIFT PINS ARE ATTACHED TO THE DRUM, AND THEREFORE EACH TIME THE CHANGE PEDAL IS DEPRESSED THE DRUM ROTATES 1/5 OF A REVOLUTION. THAT IS, ONE FULL TURN OF THE GEAR SHIFT DRUM IS MADE IN FIVE STAGES, 1ST, 2ND, 3RD, 4TH AND 5TH. SLOTTED GUIDES ARE GROOVED IN THE SHIFT DRUM, AND THE SHIFT FORK CAM FOLLOWER PINS ARE PLACED IN THESE SLOTTED GUIDES. THEREFORE, AS THE DRUM TURNS, THE SHIFT FORKS SLIDE BACK AND FORTH IN THE SLOTTED GUIDES. SHIFT FORK (1) MOVES 2ND AND 3RD GEARS, SHIFT FORK (2) THE 1ST GEAR, AND, SHIFT FORK (3) MOVES THE 4TH AND 5TH GEARS.
THE NEUTRAL POSITION IS LOCATED BETWEEN 1ST AND 2ND GEARS, AND THE NEUTRAL STOPPER MECHANISM IS LOCATED ON THE LEFT SIDE OF THE SHIFT DRUM.



SHIFTER

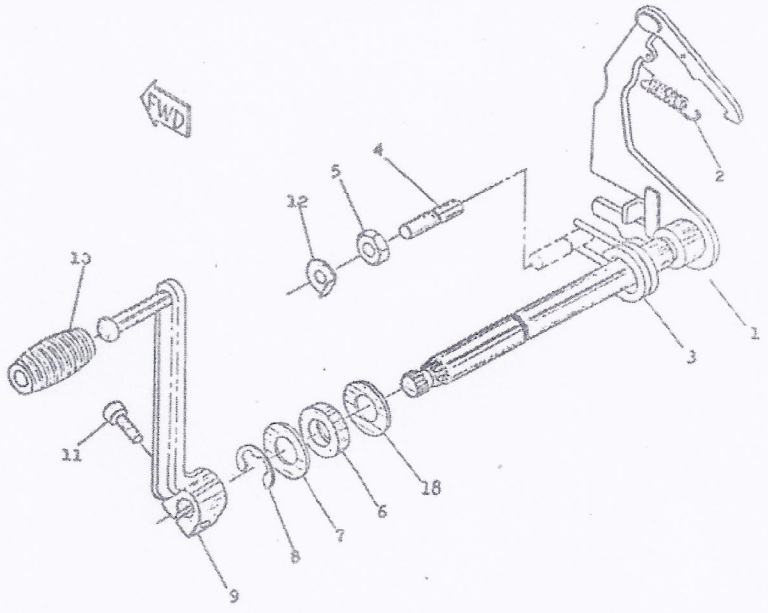
1. SHIFT FORK GUIDE BAR
2. SHIFT FORK (1)
3. SHIFT FORK (2-3)
4. PIN, CAM FOLLOWER
5. ROLLER, CAM FOLLOWER
6. COTTER PIN
7. CIRCLIP
8. SHIFT CAM
9. PIN, RACHET
10. PIN, INDEX
11. CLIP, INDEX PIN
12. PLATE
13. SCREW
14. LOCKWASHER
15. WASHER
16. HOLDER, SHIFT CAM
17. * RETAINER
18. * RETAINER RING
19. GASKET
20. COVER, SHIFT CAM
21. SCREW
22. SHIFT FORK GUIDE BAR
23. SHIFT FORK (4-5)
24. PLUG SEAL
25. DETENT LEVER ASSY.
29. SPRING, DETENT LEVER
30. BOLT
31. GASKET
32. PLUNGER ASSY., NEUTRAL DETENT
33. GASKET
34. NEUTRAL SWITCH ASSY.
35. SCREW
36. LOCKWASHER
37. GASKET
38. PLUG (MT MODELS ONLY)



* ALTERNATE CONFIGURATION

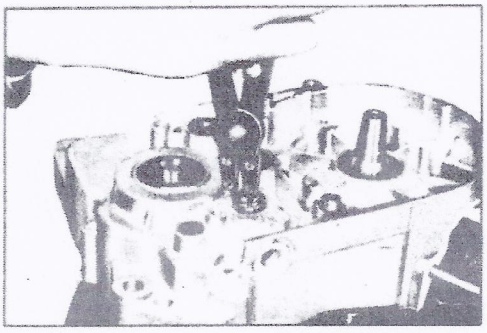
SHIFT SELECTOR

1. SELECTOR SHAFT ASSY.
2. SPRING, PAWL
3. SPRING, RETURN
4. PIN, STOP
5. JAM NUT
6. SEAL, SHIFT SELECTOR
7. WASHER
8. CIRCLIP
9. SHIFT LEVER
10. SHIFT LEVER COVER
11. CINCH BOLT
12. LOCK WASHER
18. WASHER

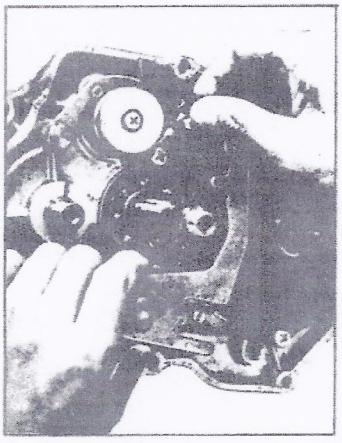


REMOVING THE CHANGE AXLE ASSEMBLY

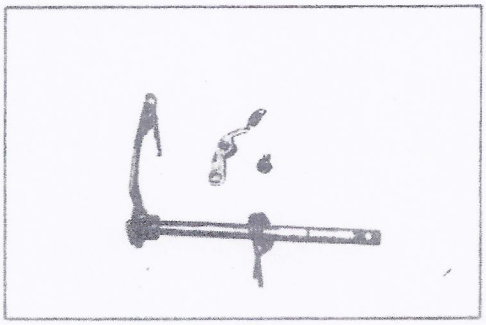
1) REMOVE THE CIRCLIP AND WASHER FROM THE CHANGE AXLE (LEFT SIDE CRANKCASE).



2) TURN THE ENGINE OVER, RIGHT SIDE UP AND PULL OUT THE CHANGE SHAFT ASSEMBLY.

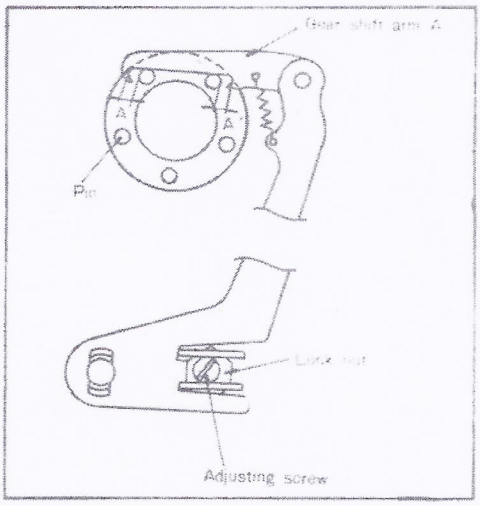


CHECK THE GEAR SHIFT RETURN SPRING. A BROKEN OR FATIGUED GEAR SHIFT RETURN SPRING WILL IMPAIR THE RETURN ACTION OF THE SHIFTING MECHANISM.



ADJUSTING THE GEAR SHIFT ARM

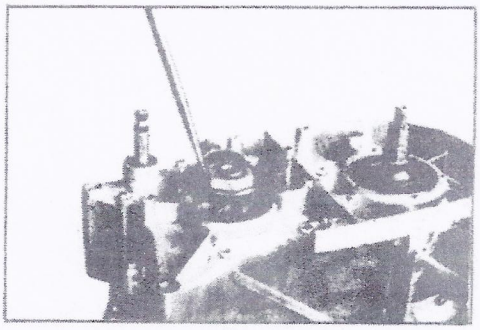
ADJUSTING OR CORRECTING THE TRAVEL OF THE GEAR SHIFT ARM TO PREVENT IMPROPER SHIFTING PROGRESSION (EXCESS FEED OR INSUFFICIENT FEED OF THE GEAR SHIFT ARM) IS ACCOMPLISHED BY TURNING THE GEAR SHIFT RETURN SPRING STOP SCREW (ECCENTRIC BOLT) IN OR OUT. ADJUST THE ECCENTRIC BOLT UNTIL DISTANCE A AND A' ARE EQUAL (TRANSMISSION IN 2ND - 4TH GEAR)



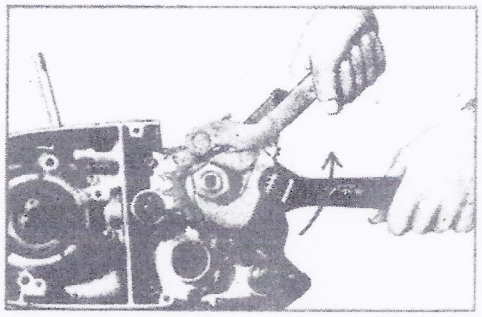
DRIVE SPROCKET

REMOVAL

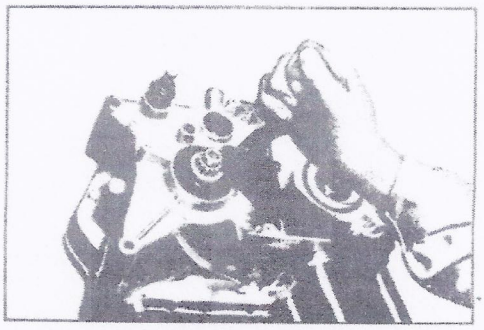
1) STRAIGHTEN THE BENT EDGE OF THE LOCK WASHER WITH A BLUNT-ENDED METAL PUNCH.



2) HOLD THE DRIVE SPROCKET WITH THE FLYWHEEL MAGNETO HOLDING TOOL, AND REMOVE THE SPROCKET NUT. IF THE FLYWHEEL MAGNETO HOLDING TOOL IS NOT AVAILABLE, SHIFT THE TRANSMISSION TO LOW GEAR, AND FIT A MONKEY WRENCH ON THE SPROCKET NUT. THEN TAP THE HANDLE OF THE WRENCH WITH A HAMMER AND THE SHOCK WILL LOOSEN THE NUT.

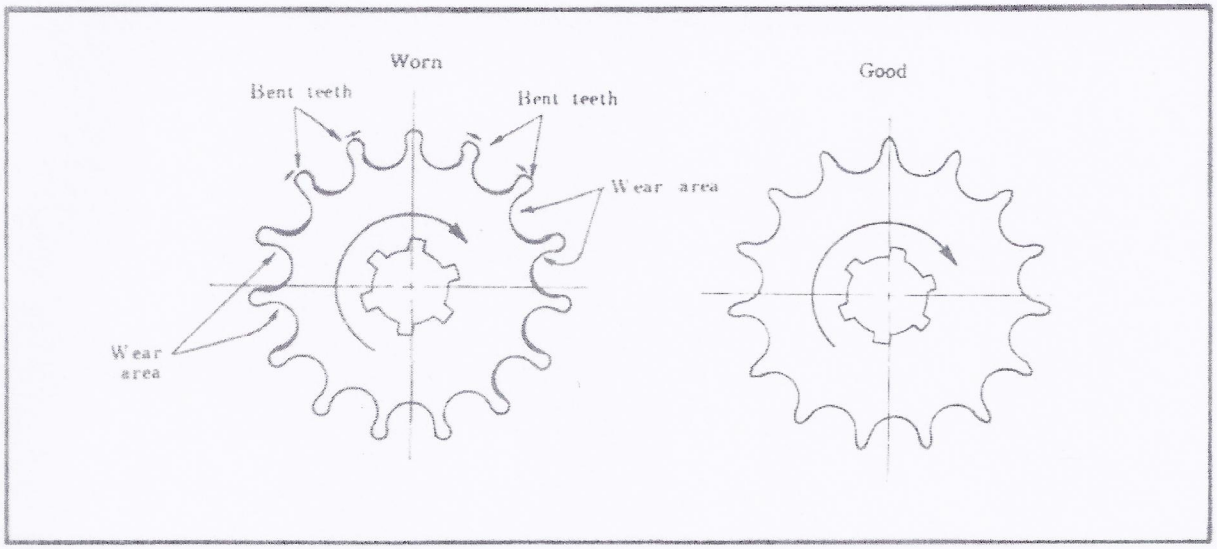


3) REMOVE THE DISTANCE COLLAR WITH PLIERS. (WHEN REINSTALLING THE DISTANCE COLLAR, APPLY GREASE TO THE OIL SEAL LIP GROOVE)



INSPECTION

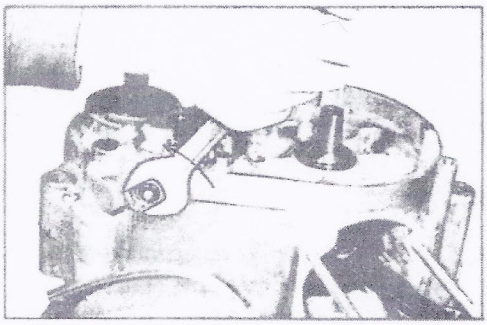
A WORN DRIVE SPROCKET WILL RESULT IN EXCESSIVE CHAIN NOISE AND SHORTEN THE LIFE OF THE CHAIN. CHECK THE SPROCKET FOR WORN TEETH, AND REPLACE IF THEY ARE WORN.

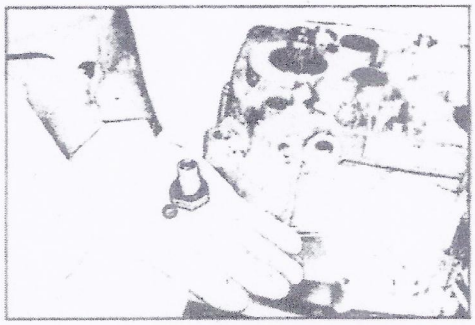


CRANKCASE

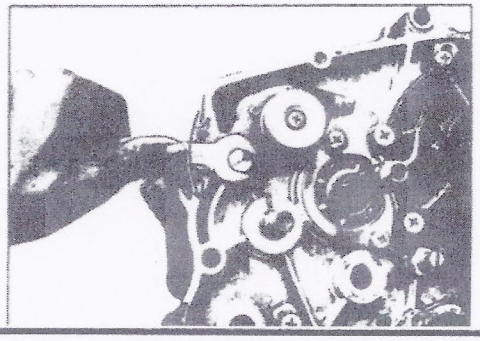
A) SEPARATING

1)REMOVE NEUTRAL STOPPER.

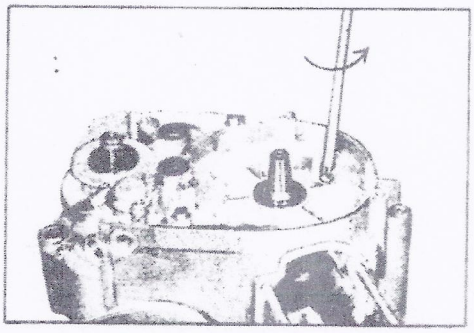




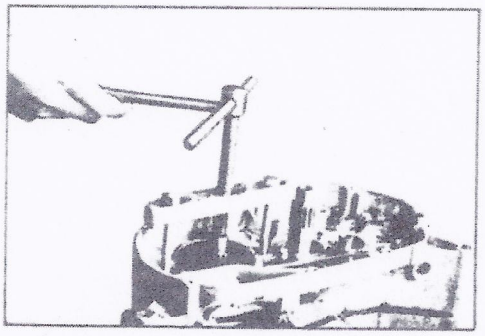
2)REMOVE THE CHANGE SHIFT DRUM STOPPER LEVER AND STOPPER ASSEMBLY.

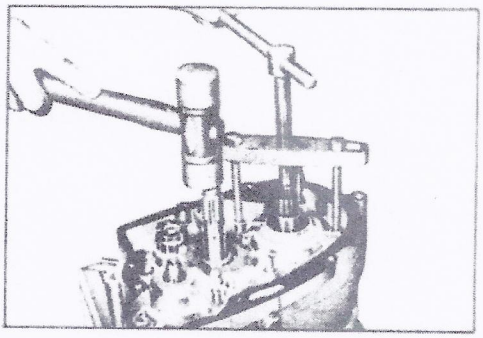


3) REMOVE THE ALLEN HEAD SCREWS FROM THE LEFT CRANKCASE.



4) INSTALL THE CRANKCASE SEPARATING TOOL ON THE RIGHT CRANKCASE. DIVIDE THE CRANKCASE WHILE ALTERNATELY TAPPING THE MAIN AXLE AND THE CRANKCASE WITH A RUBBER TIPPED HAMMER.

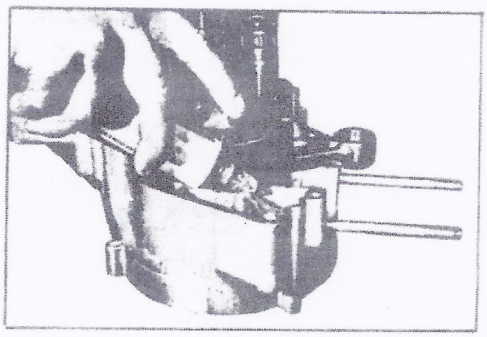




NOTE: FULLY TIGHTEN THE BOLTS OF THE CRANKCASE DIVIDING TOOL, KEEPING THE TOOL IN A HORIZONTAL POSITION.
THE CRANKCASE IS DESIGNED TO SPLIT INTO TWO HALVES, RIGHT AND LEFT. ONLY ONE DRAIN PLUG IS PROVIDED FOR BOTH THE TRANSMISSION AND CLUTCH HOUSINGS. BOTH HOUSINGS CAN BE DRAINED AT THE SAME TIME BY REMOVING THE DRAIN PLUG.

B) REASSEMBLING

WHEN REASSEMBLING THE CRANKCASE, BE SURE TO APPLY GASKET CEMENT TO THE MATING SURFACES OF BOTH HALVES AFTER CLEANING THEM THOROUGHLY.



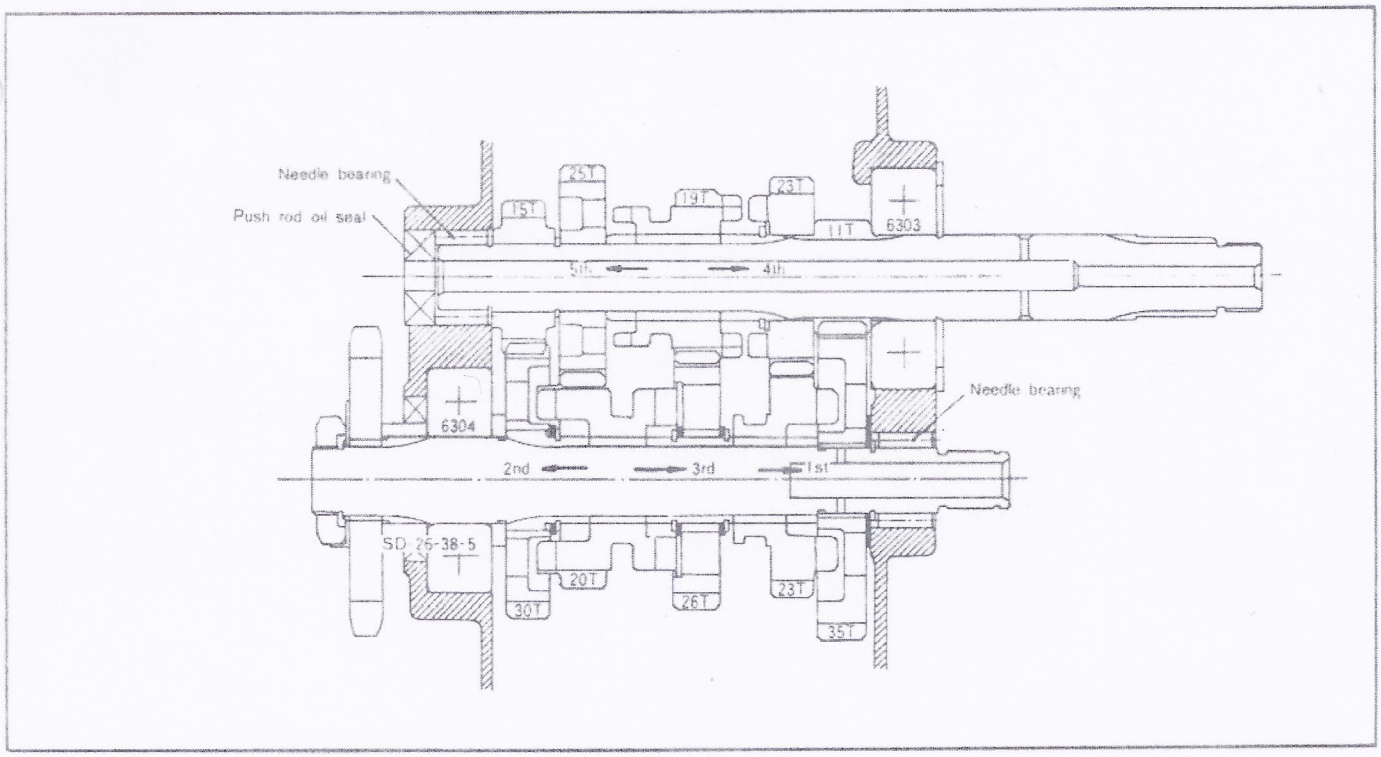
TRANSMISSION ASSEMBLY

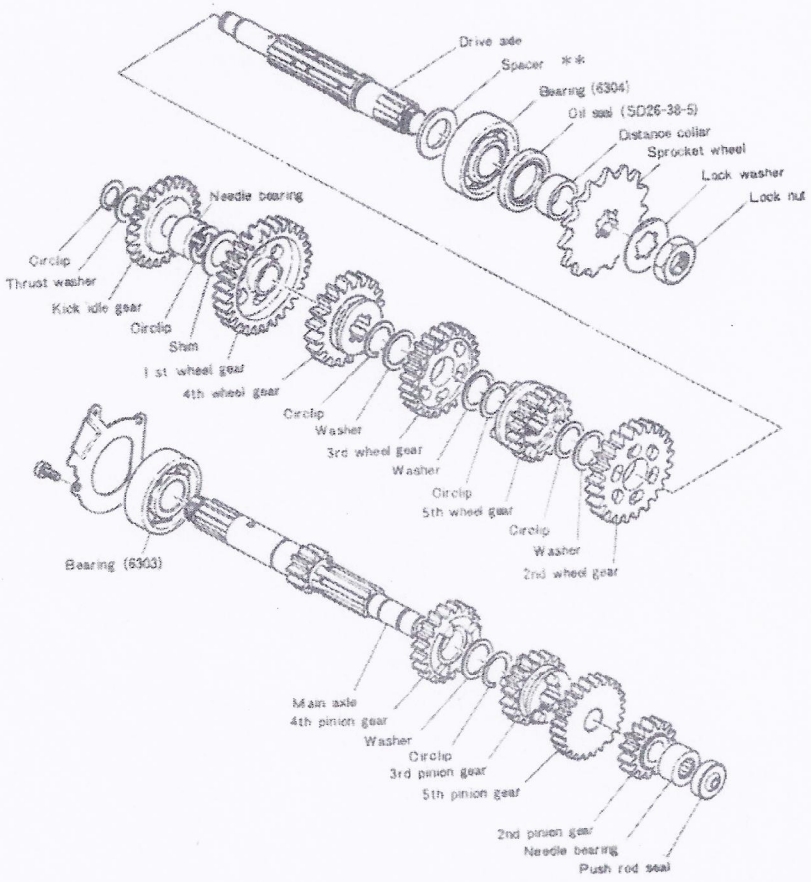
THE CONSTANT MESH, WIDE RATIO, 5-SPEED TRANSMISSION MAKES IT POSSIBLE TO FULLY UTILIZE THE STEADY PERFORMANCE OF THE ENGINE THROUGHOUT THE ENTIRE SPEED RANGE FROM LOW TO HIGH.

THE PRIMARY REDUCTION RATION IS 74/19=3.895. THEREFORE THE TOTAL REDUCTION RATIOS WILL BE; PRIMARY REDUCTION RATIO X TRANSMISSION GEAR REDUCTION X SECONDARY REDUCTION RATIO = TOTAL REDUCTION RATIO.

PRIMARY REDUCTION RATIO. . . . .74/19=3.89

	TRANSMISSION GEAR REDUCTION RATIO
1ST	35/11=3.182
2ND	30/15=2.000
3RD	26/19=1.368
4TH	23/23=1.000
5TH	20/25=0.800



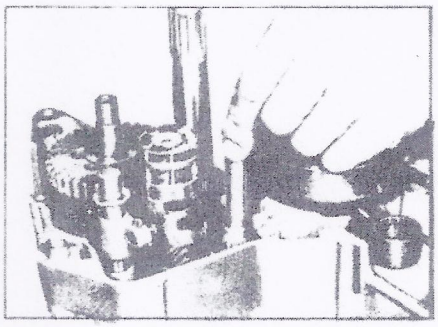


* USE A FEELER GAUGE TO MAINTAIN .1MM GAP BETWEEN 2ND PINION GEAR AND 5TH PINION GEAR WHEN PRESSING 2ND GEAR PINION ONTO THE SHAFT.

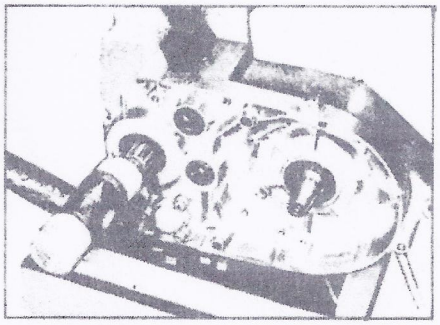
*** THIS SPACER HAS A RADIUS ON ONE SIDE OF THE I.D. THIS RADIUS MUST FACE OUTWARD, TOWARD THE BEARING WHEN THE DRIVE AXLE IS INSTALLED IN THE MACHINE. IF IT IS REVERSED DURING ASSEMBLY THE SPACING WILL BE INCORRECT AND THE 2ND GEAR WHEEL MAY EVENTUALLY FREEZE UP ON THE DRIVE AXLE. ALWAYS CHECK THE 2ND GEAR WHEEL TO SEE THAT IT SPINS FREELY ON THE DRIVE AXLE AND THAT IT IS FREE TO SLIDE OFF THE DRIVE AXLE. THE FIRST INDICATION OF A SPACING PROBLEM IS A MUSHROOMING OF THE STEP IN THE DRIVE AXLE OVER WHICH THE DRIVE AXLE SPACER RIDES.

A) REMOVAL

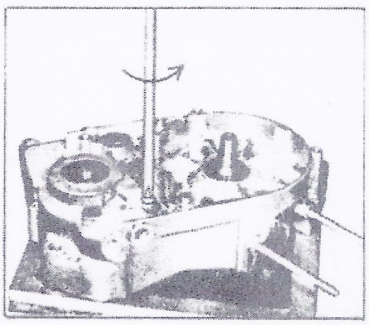
1) PULL OUT THE TWO SHIFT FORK GUIDE BARS.

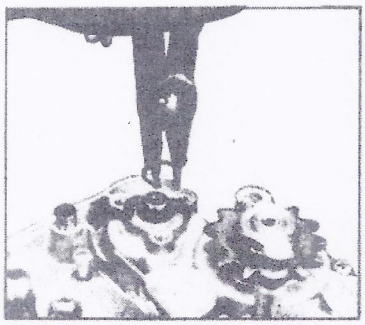


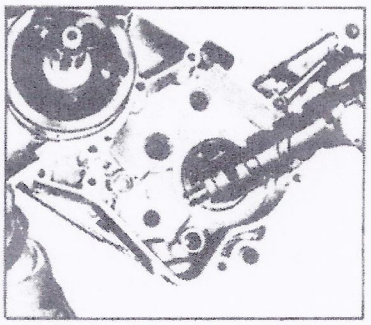
2) REMOVE BOTH THE TRANSMISSION ASSEMBLY AND THE SHIFT FORKS FROM THE CRANKCASE, WHILE TAPPING THE DRIVE SHAFT END WITH A PLATIC-TIP HAMMER.



3) TO REMOVE THE SHIFT DRUM, REMOVE THE SHIFT CAM BLIND PLUG SET SCREW ON THE LEFT SIDE OF THE CRANKCASE, AND REMOVE THE SHIFT CAM BLIND PLUG. THEN REMOVE THE CLIP AND WASHER FROM THE SHIFT DRUM, AND THE SHIFT DRUM CAN BE PULLED OUT FROM THE OPPOSITE SIDE.

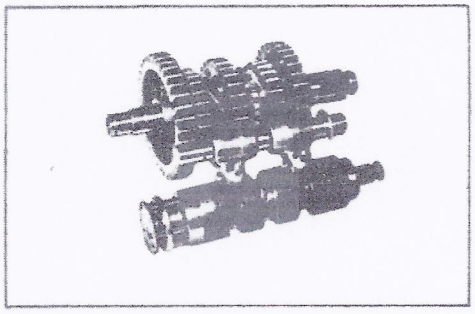






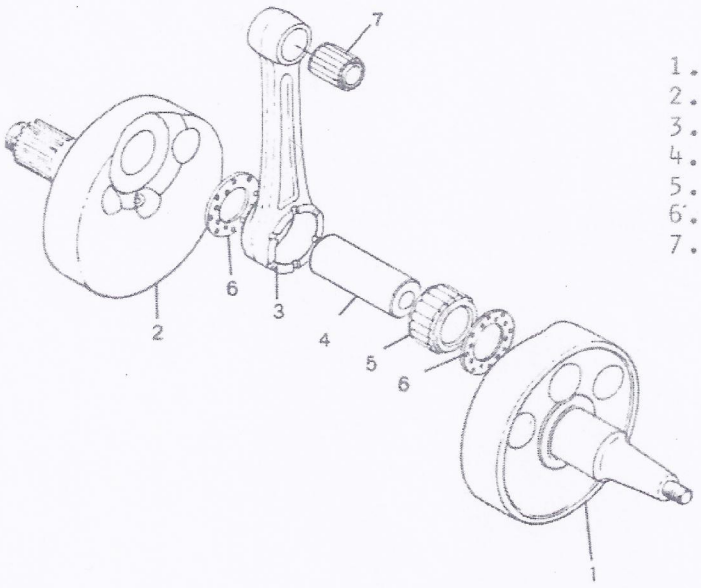
B. REINSTALLATION

REINSTALL THE TRANSMISSION AND SHIFTER AS A UNIT IN THE LEFT CRANKCASE HALF AFTER THEY ARE SUB-ASSEMBLED. THEY CANNOT BE INSTALLED SEPARATELY. THE TRANMISSION UNIT MUST BE IN NEUTRAL DURING INSTALLATION.



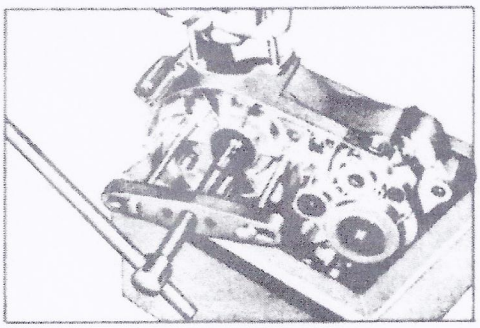
CRANKSHAFT

THE CRANKSHAFT REQUIRES THE HIGHEST DEGREE OF ACCURACY IN ENGINEERING AND SERVICING OF ALL THE ENGINE PARTS.
THE CRANKSHAFT IS ALSO MORE SUSCEPTIBLE TO WEAR, AND THEREFORE, IT MUST BE HANDLED WITH SPECIAL CARE.



1. CRANK (L.H.)
2. CRANK (R.H.)
3. CONNECTING ROD
4. CRANK PIN
5. BEARING
6. CRANK PIN WASHER
7. BEARING

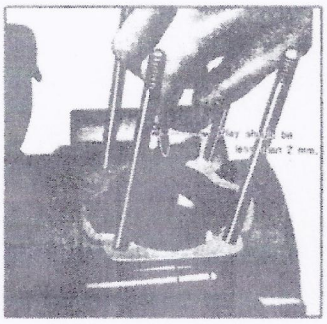
A) REMOVING THE CRANKSHAFT ASSEMBLY
REMOVE THE CRANKSHAFT ASSEMBLY WITH THE CRANKCASE SEPARATING TOOL.
NOTE: FULLY TIGHTEN THE BOLTS OF THE CRANKCASE DIVIDING TOOL, AND KEEP THE TOOL PARALLEL WITH THE CRANKCASE SURFACE.

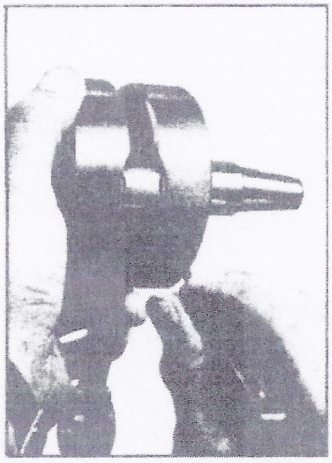


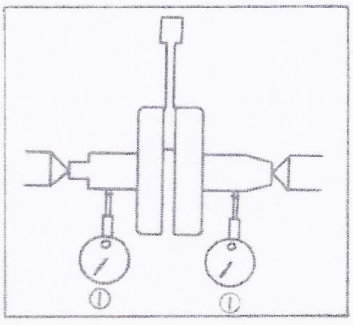
INSPECTION AND SERVICING

1)CHECK THE CRANKSHAFT COMPONENTS

Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end)	Small end play should not exceed 2mm. (0.078 in.)	If small end play exceeds 2mm, disassemble the crankshaft, check connecting rod crank pin and large end bearing. Replace defective parts. Small end play after reassembly should be within 0.8-1.0mm. (0.031~0.04 in.)
Check the connecting rod for axial play at large end.	Move the connecting rod to one side and insert a feeler gauge. Large end axial play should be within 0.4-0.5mm. (0.019 in.)	If excessive axial play is present, (0.6mm or more) disassemble the crankshaft and replace any worn parts.
Check accuracy of the crankshaft ass'y runout. (Misalignment of parts of the crankshaft)	Dial gauge readings should be within 0.02 mm. (0.0008 in.)	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.

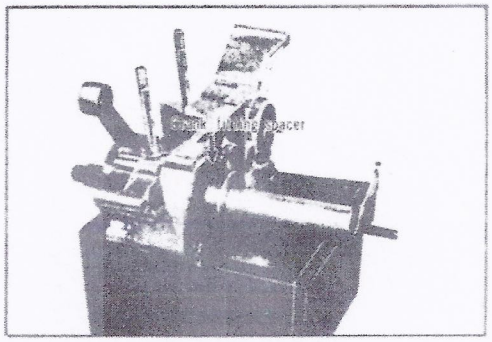


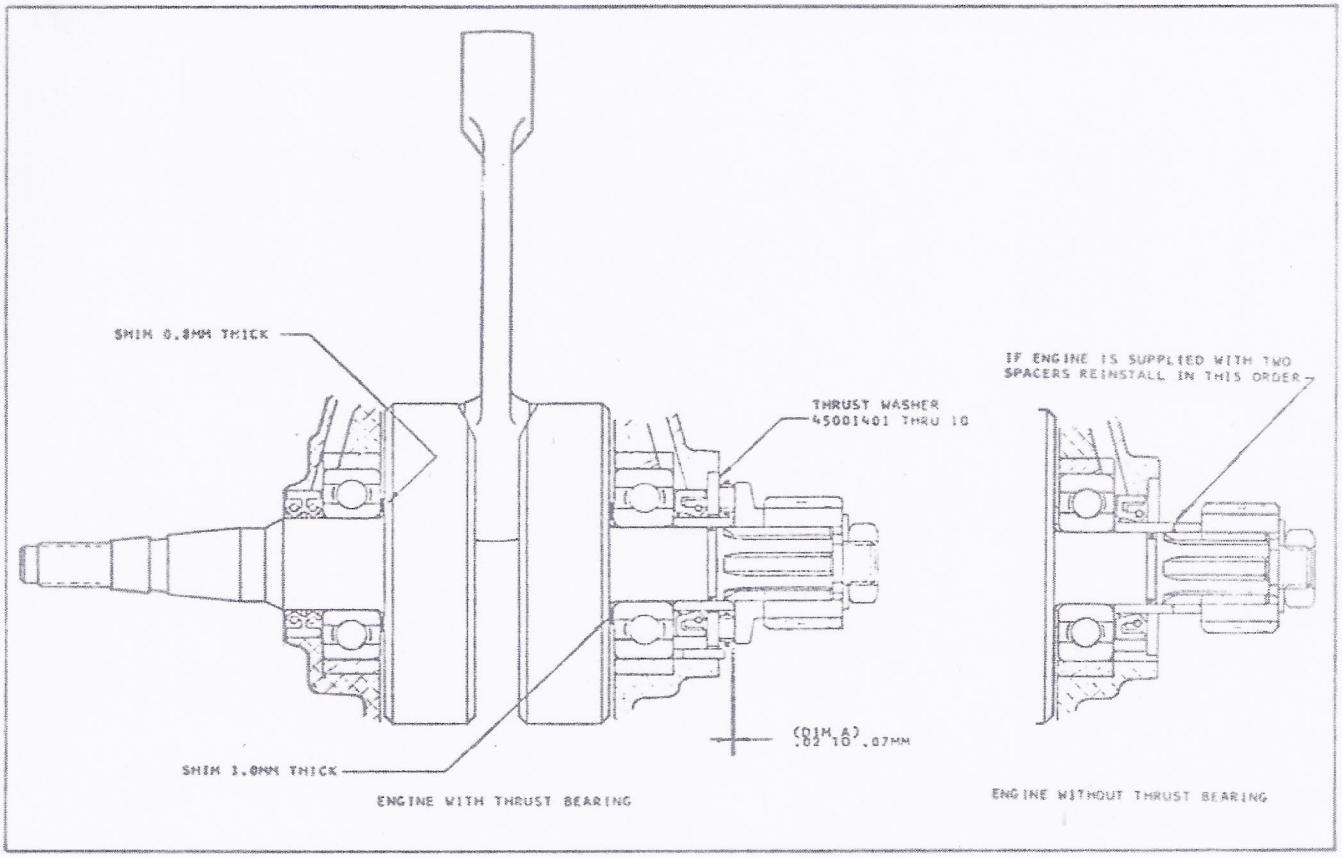




B) INSTALLING THE CRANKSHAFT ASSEMBLY

PUT SHIMS ON BOTH ENDS OF THE CRANK-SHAFT, AND INSTALL THE CRANKSHAFT ASSEMBLY BY USING THE CRANKSHAFT INSTALLING TOOL.
HOLD THE CONNECTING ROD AT TOP DEAD CENTER WITH ONE HAND WHILE TURNING THE HANDLE OF THE INSTALLING TOOL WITH THE OTHER.

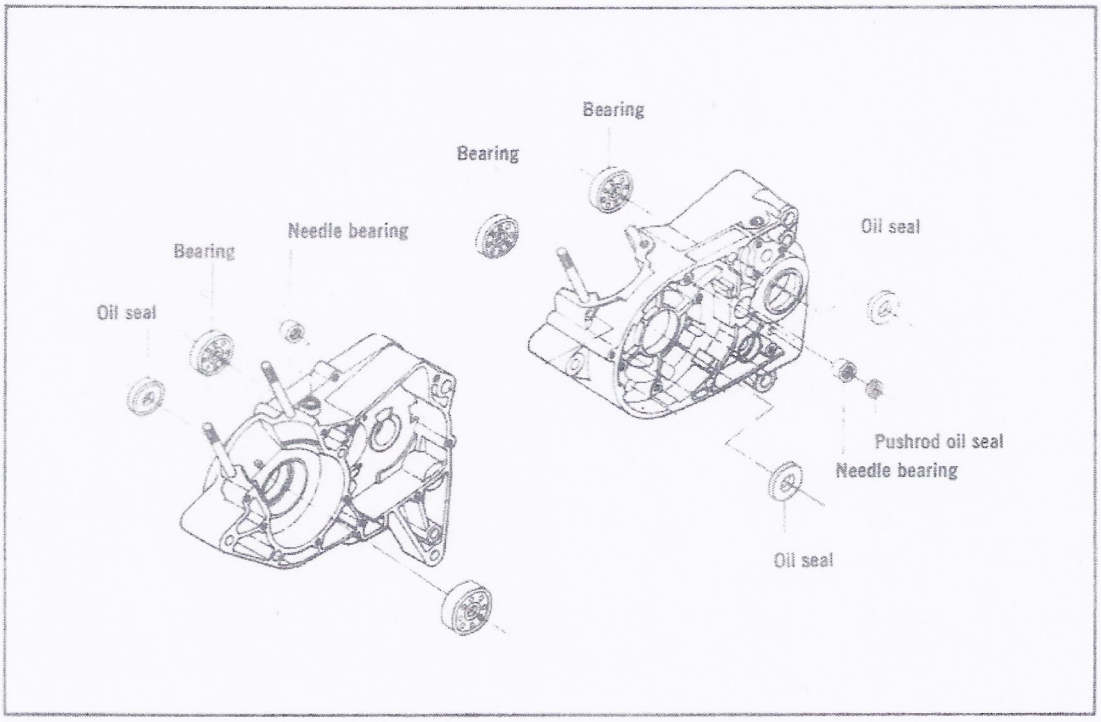




NOTE: WHEN THE CRANKSHAFT IS REINSTALLED ALWAYS REASSEMBLE WITH THE SHIMS IN THE SAME LOCATION.
IF THE CRANKSHAFT IS REBUILT OR REPLACED INSTALL ONLY A 1.0MM (.04") SHIM P/N 45001130 ON THE DRIVE (R.H.) SIDE OF THE CRANK-SHAFT.

NOTE: INDIAN HAS PRODUCED ENGINES BOTH WITH AND WITHOUT THRUST BEARING ASSEMBLIES. THE CRANKSHAFT AND SHIM SELECTION IS THE SAME IN EITHER CASE, HOWEVER, IF YOUR ENGINE HAS A THRUST BEARING REFER TO PAGE 26 FOR FURTHER INFORMATION.

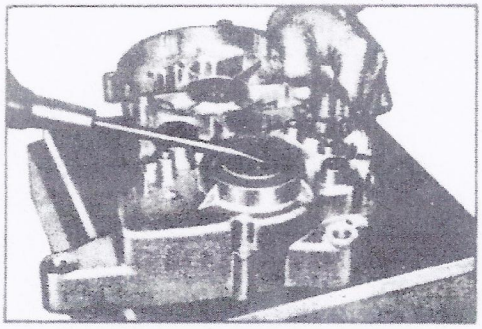
BEARINGS AND OIL SEALS



C) SEAL AND BEARING REMOVAL AND INSTALLATION

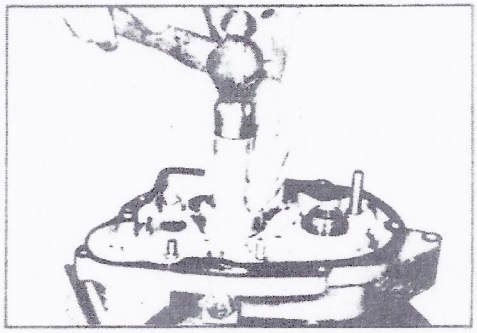
1) REMOVAL

PRY THE OIL SEALS OUT OF PLACE WITH A SLOT HEAD SCREWDRIVER.
ALWAYS REPLACE THE OIL SEALS WHEN OVERHAULING THE ENGINE.



2) DRIVE OUT THE BEARING WITH A BEARING TOOL.

NOTE: BEARINGS ARE MOST EASILY REMOVED OR INSTALLED IF THE CASES ARE FIRST HEATED TO APPROXIMATELY 200°-400°F.



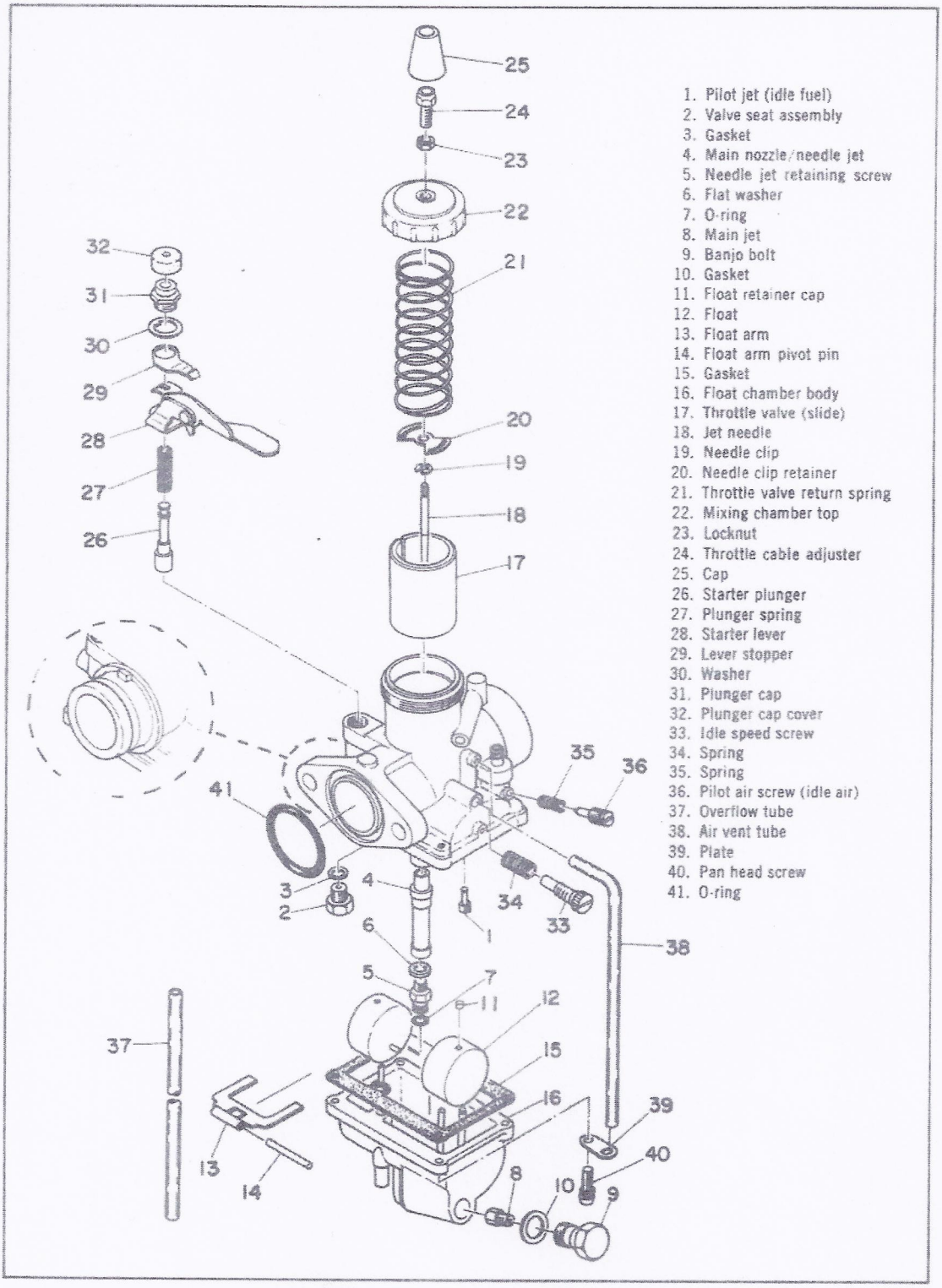
3) INSTALLATION
INSTALL BEARINGS AND OIL SEALS WITH THEIR STAMPED MANUFACTURER'S MARKS OR NUMERALS FACING OUTWARD. (IN OTHER WORDS, THE STAMPED LETTER MUST BE ON THE EXPOSED VIEW SIDE) WHEN INSTALLING BEARINGS, PACK THEM WITH GREASE.

CARBURETOR

THE STANDARD I-125 AND I-175 ARE EQUIPPED WITH A VM26SC2 CARBURETOR THAT IS EQUIPPED WITH A BUILT-IN STARTER JET.

THE CARBURETOR IS CLAMPED TO A RUBBER INTAKE MANIFOLD THAT IS LOCATED BETWEEN THE CARBURETOR AND CYLINDER. THIS MANIFOLD PROVIDES MORE THAN ADEQUATE HEAT INSULATION. THE CARBURETOR FLOATS HAVE BEEN SPECIALLY DESIGNED TO KEEP THE FLOAT LEVEL FROM FLUCTUATING DUE TO VIBRATION OR SHOCK. THE MAIN JET IS INSTALLED IN SUCH A MANNER TO PROVIDE QUICK AND EASY REPLACEMENT FROM THE OUTSIDE BY MERELY REMOVING THE JET HOLDER ON THE BOTTOM LEFT SIDE OF THE CARBURETOR FLOAT BOWL.

CARBURATOR ASSEMBLY



A) CHECKING THE CARBURETOR

1) FLOAT

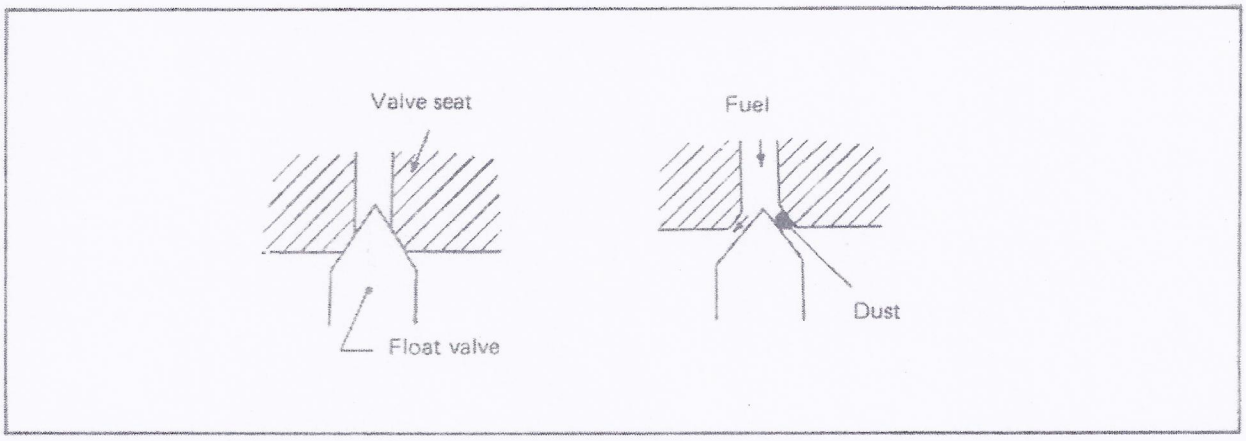
REMOVE THE FLOAT AND SHAKE IT TO CHECK IF GASOLINE IS INSIDE. IF FUEL LEAKS INTO THE FLOAT WHILE THE ENGINE IS RUNNING, THE FLOAT CHAMBER FUEL LEVEL WILL RISE AND MAKE THE FUEL MIXTURE TOO RICH. REPLACE THE FLOAT IF IT IS DEFORMED OR LEAKING.

2) FLOAT VALVE

REPLACE THE FLOAT VALVE IF ITS SEATING END IS WORN WITH A STEP OR IF IT IS SCRATCHED. CHECK THE FLOAT VALVE SPRING FOR FATIGUE. DEPRESS THE FLOAT VALVE WITH YOUR FINGER, AND MAKE SURE THAT IT PROPERLY SEATS AGAINST THE VALVE SEAT. IF THE FLOAT VALVE SPRING IS WEAKENED, FUEL WILL OVERFLOW FLOODING THE FLOAT CHAMBER WHILE THE GAS IS ON.

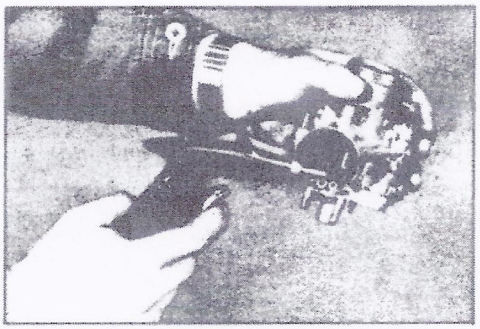
3) OVERFLOWING

IF FUEL OVERFLOWS, CHECK THE CARBURETOR AS DESCRIBED IN 1) AND 2) ABOVE. IF NEITHER 1) NOR 2) CURES THE OVERFLOW, IT MAY BE CAUSED BY DIRT OR DUST IN THE FUEL PREVENTING THE FLOAT VALVE FROM SEATING PROPERLY. IF ANY DIRT OR DUST IS FOUND, CLEAN THE CARBURETOR PETCOCK AND GAS TANK.



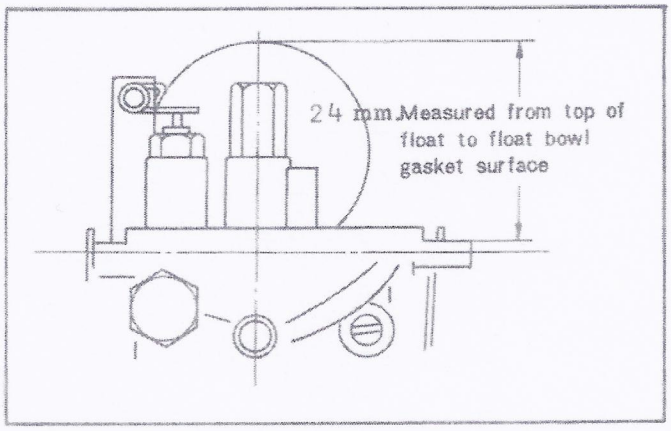
4) CLEANING THE CARBURETOR

DISASSEMBLE THE CARBURETOR, AND WASH ALL ITS PARTS IN A SUITABLE SOLVENT.
THEN BLOW ALL THE PARTS OFF WITH COMPRESSED AIR. ALL JETS AND OTHER DELICATE PARTS SHOULD BE CLEANED BY BLOWING COMPRESSED AIR THROUGH THEM AFTER THE FLOAT BOWL HAS BEEN REMOVED.



B) FLOAT LEVEL ADJUSTMENT

THE CARBURETOR FLOAT LEVEL IS CHECKED BY THE INDIAN FACTORY DURING ASSEMBLY AND TESTING. BUT ROUGH RIDING, WORN NEEDLE VALVE, OR BENT FLOAT ARM CAN CAUSE THE FLOAT LEVEL TO FLUCTUATE. IF THE FLOAT LEVEL RAISES, THIS WILL CAUSE A RICH FUEL/AIR MIXTURE THAT CAN CAUSE POOR PERFORMANCE AND SPARK PLUG FOULING. IF THE FLOAT LEVEL DECREASES, THIS CAN CAUSE A LEAN FUEL/AIR MIXTURE THAT CAN RESULT IN ENGINE DAMAGE. IF THE MACHINE IS SUBJECTED TO CONTINUOUS ROUGH RIDING OR MANY MILES OF TRAVEL, THE FLOAT LEVEL SHOULD BE CHECKED AND SET REGULARLY AND IN THE FOLLOWING MANNER.



1)REMOVE THE FLOAT CHAMBER BODY, AND TURN OVER THE MIXING BODY. LET THE FLOAT ARM REST ON THE NEEDLE VALVE WITHOUT COMPRESSING THE SPRING.

2)THEN MEASURE THE DISTANCE FROM THE TOP OF THE FLOAT TO THE FLOAT BOWL GASKET SURFACE. STANDARD MEASUREMENT IS 24MM.

3)WHEN THE DISTANCE MEASURES LESS THAN THE RECOMMENDED DISTANCE, BEND THE TANG UP. IF IT IS GREATER, BEND THE TANG DOWN (WITH CARBURETOR BODY UP SIDE DOWN).

C) IDLE MIXTURE-IDLE SPEED ADJUSTMENTS

THE IDLE MIXTURE ADJUSTMENT SHOULD BE SET EXACTLY TO FACTORY SPECIFICATIONS. FIRST, TURN THE AIR SCREW IN UNTIL IT LIGHTLY SEATS THEN BACK IT OUT 1 1/2 TURNS. NEXT, ADJUST THE THROTTLE STOP SO THAT THE ENGINE IDLES AT 1200-1300 RPM.

D) CARBURETOR SETTING TABLES

NAME OF PART	ABBREVIATION	SPECIFICATIONS I-125	I-175
MAIN JET	M.J.	#170	#170
NEEDLE JET	N.J.	N-6	N-6
JET NEEDLE	J.N.	5FL11-3	5FL11-3
PILOT JET	P.J.	#35	#35
THROTTLE VALVE CUT AWAY	C.A.	2.0	2.0
AIR SCREW SETTING (T.OUT)	A.S.	1 1/2	1 1/2
IDLING SPEED	-	1200-1300 RPM	1200-1300 RPM

AIR CLEANER

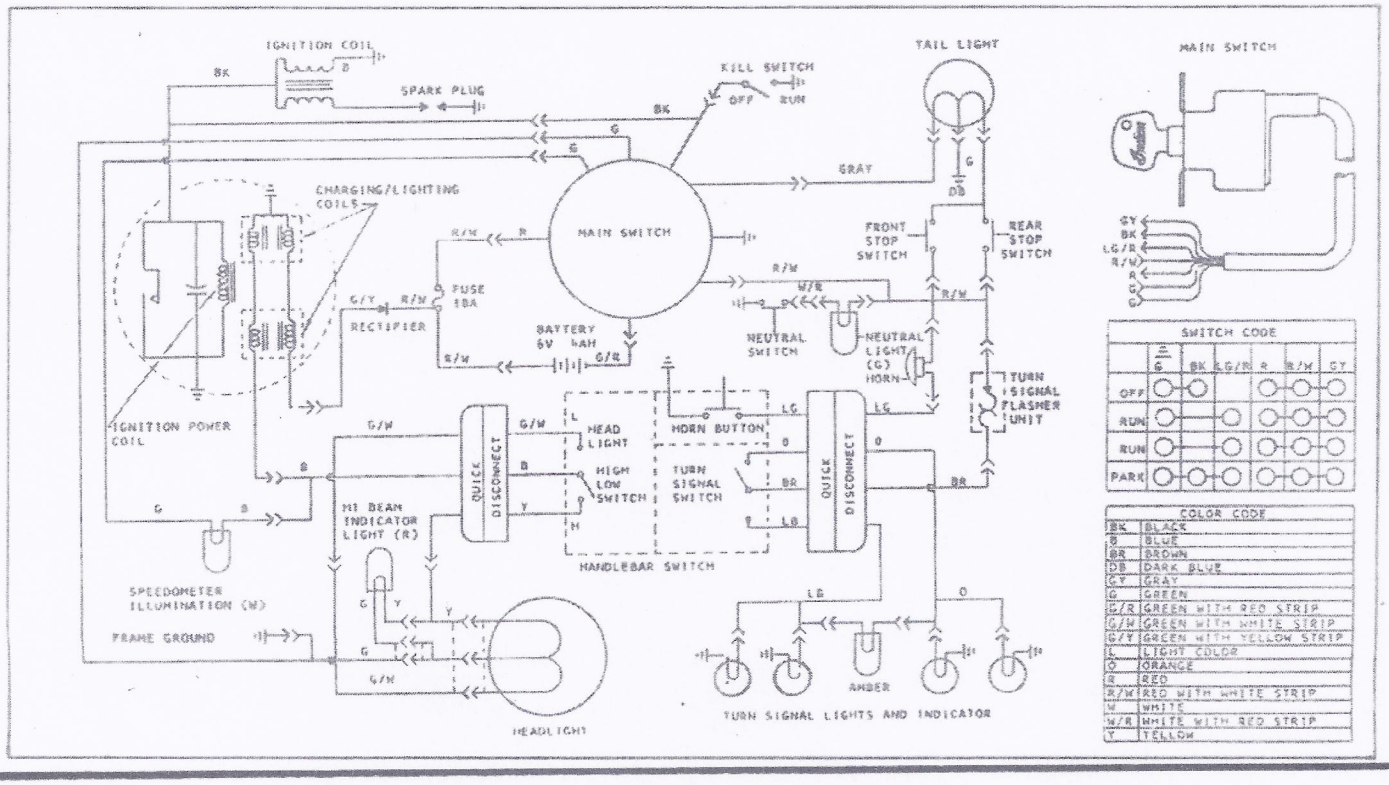
INDIAN MOTORCYCLES ARE EQUIPPED WITH A REUSEABLE, OIL IMPREGNATED, FOAM AIR FILTER. IT MUST BE REMOVED AND CLEANED AT LEAST ONCE A MONTH, MORE OFTEN IF THE MOTORCYCLE IS RIDDEN MAINLY IN THE DIRT, PREFERABLY EACH TIME AFTER YOU SPEND AN ENTIRE DAY IN THE DIRT. (4-5 HOURS OPERATION).

ELECTRICAL SYSTEM

DESCRIPTION

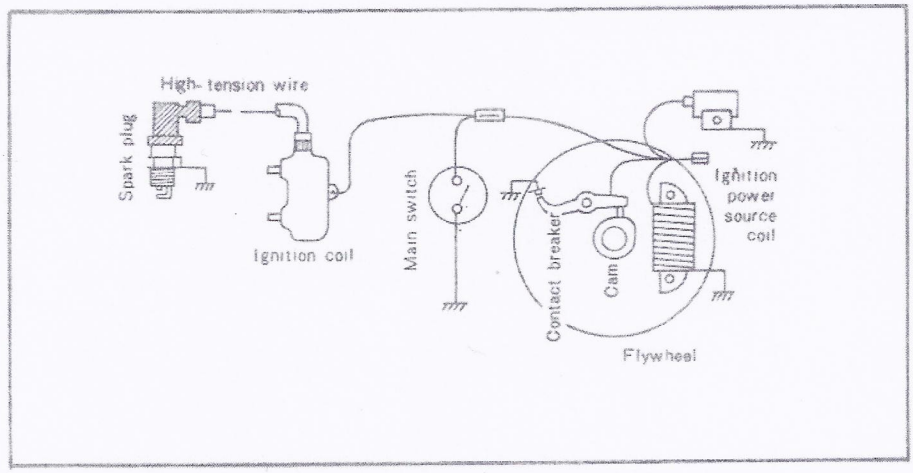
THE I-125 AND I-175 SERIES ENGINES EMPLOY A TAIGENE(HITACHI #F136-08404A) FLYWHEEL MAGNETO FOR ITS IGNITION SYSTEM.

CONNECTION DIAGRAM



IGNITION SYSTEM

THE IGNITION SYSTEM CONSISTS OF THE COMPONENTS AS SHOWN IN ILLUSTRATION BELOW. AS THE FLYWHEEL ROTATES, THE CONTACT BREAKER POINTS BEGIN TO OPEN AND CLOSE, ALTERNATELY. THIS MAKE-AND-BREAK OPERATION DEVELOPS AN ELECTROMOTIVE FORCE IN THE IGNITION POWER SOURCE COIL, AND PRODUCES A VOLTAGE IN THE IGNITION COIL PRIMARY WINDINGS. THE IGNITION COIL IS A KIND OF TRANSFORMER, WITH A 1:50 TURN RATIO OF THE PRIMARY TO THE SECONDARY WINDING. THE VOLTAGE (150-300V) WHICH IS PRODUCED IN THE PRIMARY COIL, IS STEPPED UP TO 12,000-14,000 V BY MUTUAL-INDUCTION, AND THE ELECTRIC SPARK JUMPS ACROSS THE SPARK PLUG ELECTRODES.



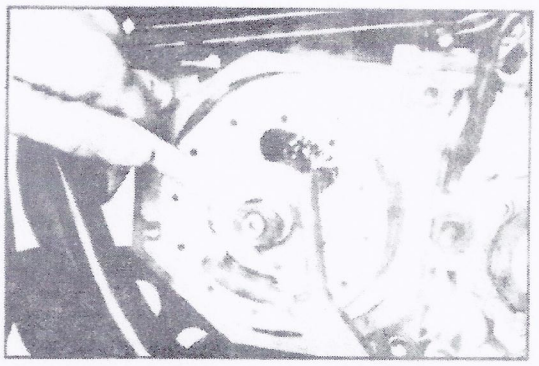
IGNITION TIMING

REMOVE THE SPARK PLUG AND SCREW THE DIAL INDICATOR HOLDER INTO THE PLUG HOLE. NEXT, INSERT THE DIAL INDICATOR INTO THE HOLDER. BRING THE PISTON UP TO T.D.C. AND SET THE ZERO ON THE DIAL FACE TO LINE UP EXACTLY WITH THE DIAL INDICATOR NEEDLE. THE CRANKSHAFT SHOULD THEN BE TURNED BACKWARDS, SO THAT THE PISTON TRAVELS DOWN PAST 2.0MM B.T.C.D. AND SLOWLY BROUGHT BACK UP TO PRECISELY 2.0MM B.T.D.C. (THIS REMOVES ANY SLACK IN THE GEARS AND BEARINGS) ADJUST THE POINTS SO THAT THEY ARE JUST BEGINNING TO OPEN WITH THE PISTON IN THIS POSITION. A LOW RESISTANCE POINT CHECKER (10 OHMS OR LESS) SHOULD BE USED TO DETERMINE THE OPENING AND CLOSING OF THE IGNITION POINTS.

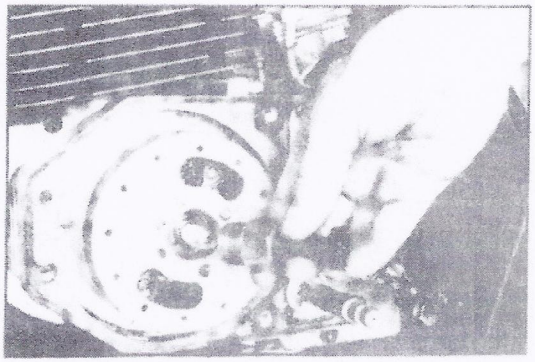
IGNITION TIMING, 2.0MM B.T.D.C.
IGNITION POINT GAP 0.3 TO 0.4MM (0.012" 0.016")

REMOVING THE FLYWHEEL

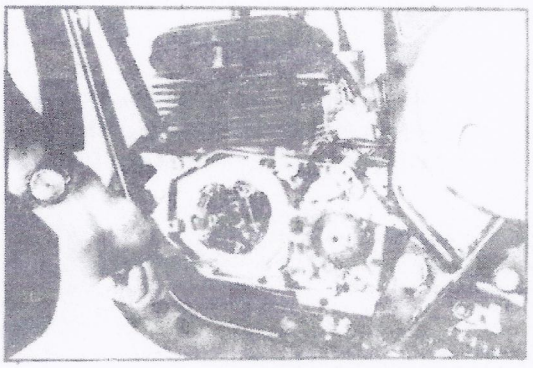
THE I-125 AND I-175 ENGINE MODELS ARE EQUIPPED WITH A FLYWHEEL MAGNETO. REMOVE THE NUT USING A FLYWHEEL MAGNETO HOLDING TOOL.



REMOVE THE FLYWHEEL MAGNETO. USE MAGNETO PULLER.



REMOVE THE FLYWHEEL MAGNETO BASE.

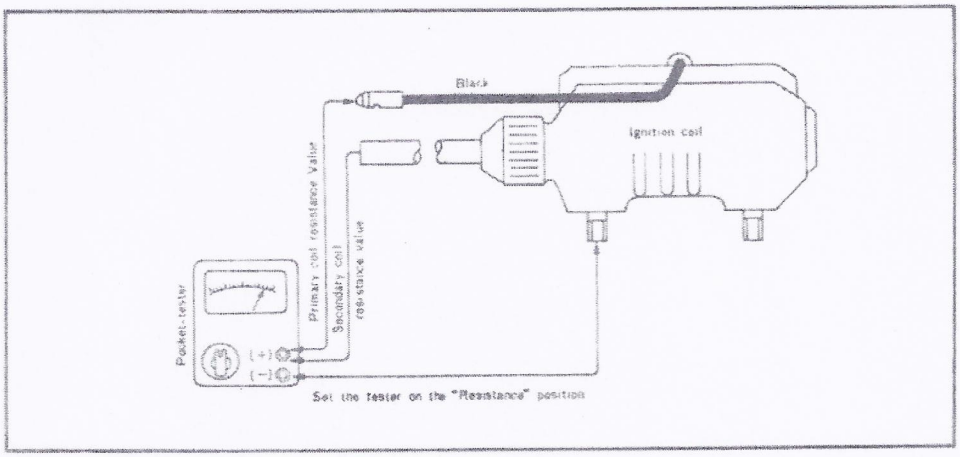


IGNITION COIL (HIGH TENSION #CM61-20)

PRIMARY COIL RESISTANCE VALUE . . . . 1.7 Ω ± 10% (20°C OR 68°F)
(BLACK WIRE TO GND.)

SECONDARY COIL RESISTANCE VALUE . . . 6.5KΩ ± 10% (20°C OR 68°F)
(SPARK PLUG WIRE TO GND.)

FOR MEASURING METHODS, REFER TO ILLUSTRATION BELOW:

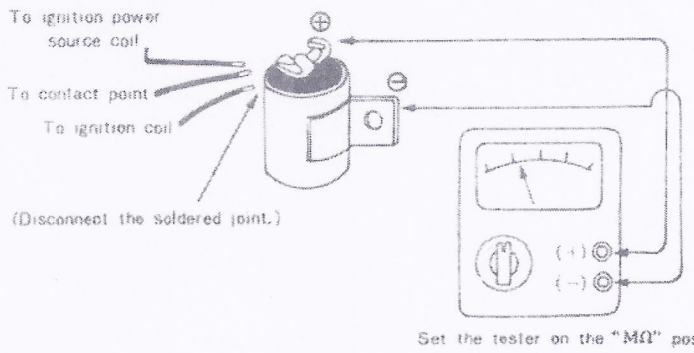


NOTE: WHEN MEASURING HIGH TENSION COIL RESISTANCE VALUE, DISCONNECT THE PLUG CAP AND BE CERTAIN THAT THE POINTS ARE "OPEN".

SPARK TEST:
REMOVE SPARK PLUG FROM CYLINDER HEAD AND RECONNECT THE HIGH VOLTAGE LEAD. THEN HOLD THE SPARK PLUG APPROXIMATELY 7MM AWAY FROM THE HEAD AND SEE IF IT SPARKS AS YOU CRANK THE KICKSTARTER.
IF IT SPARKS AT 7MM AND HAS BLUE WHITE COLOR, THE IGNITION COIL SHOULD BE CONSIDERED TO BE IN GOOD CONDITION.

PRIMARY COIL:
(+) TEST METER LEAD TO THE BLACK WIRE AND THE (-) TEST METER LEAD TO GROUND = 2.0 OHMS ± 10%. THE POINTS MUST BE "OPEN" FOR THIS TEST.

CONDENSER
THE CONDENSER INSTANTLY STORES A STATIC ELECTRIC CHARGE AS THE CONTACT BREAKER POINTS SEPARATE, AND THE ENERGY STORED IN THE CONDENSER DISCHARGES INSTANTLY WHEN THE POINTS ARE CLOSED. IF IT WERE NOT FOR THE CONDENSER, AN ELECTRIC ARC WOULD JUMP ACROSS THE SEPARATING CONTACT POINTS, CAUSING THEM TO BURN.
BURNED CONTACT POINTS GREATLY AFFECT THE FLOW OF CURRENT IN THE PRIMARY WINDING OF THE IGNITION COIL.
IF THE CONTACT POINTS SHOW EXCESSIVE WEAR, OR THE SPARK IS WEAK (THE IGNITION COIL IS IN GOOD CONDITION), CHECK THE CONDENSER.



INSULATION RESISTANCE TESTS SHOULD BE CONDUCTED BY CONNECTING THE TESTER AS SHOWN IN ILLUSTRATION ABOVE. IF THE METER READING IS MORE THAN 3MΩ , THE INSULATION IS IN GOOD CONDITION. IF THE INSULATION IS FAULTY, THE POINTER WILL STAY POINTING AT A LOWER READING, INDICATING VERY LITTLE RESISTANCE.

NOTE: AFTER THIS MEASUREMENT, THE CONDENSER SHOULD BE DISCHARGED BY CONNECTING THE POSITIVE AND NEGATIVE SIDES WITH A THICK WIRE. CAPACITY TESTS CAN BE PERFORMED BY SIMPLY SETTING THE TESTER TO THE CONDENSER CAPACITY. THE TESTER SHOULD BE CONNECTED WITH THE CONDENSER IN THE SAME WAY AS IN THE CASE OF THE INSULATION RESISTANCE TEST. BEFORE THIS MEASUREMENT, BE SURE TO SET THE TESTER CORRECTLY.

IF THE READING IS WITHIN 0.22 TO 0.30μF, THE CONDENSER CAPACITY IS CORRECT.

CHARGING SYSTEM

THE CHARGING SYSTEM CONSISTS OF THE FLYWHEEL MAGNETO (CHARGING AND LIGHTING COILS), RECTIFIER AND BATTERY.

FLYWHEEL MAGNETO

AS THE FLYWHEEL ROTATES, AN ALTERNATING CURRENT IS GENERATED IN THE CHARGING AND LIGHTING COILS AND CONVERTED TO A HALF-WAVE CURRENT BY MEANS OF A SILICON RECTIFIER. THIS HALF-WAVE CURRENT CHARGES THE BATTERY.

* THE CHARGING AND LIGHTING CAPACITY IS OBTAINED WHEN THE BATTERY IS FULLY CHARGED. IF THE BATTERY IS IN A LOW STATE OF CHARGE AND LOW IN VOLTAGE, THE CHARGING RATE WILL NOT BE EXACTLY THE SAME AS SHOWN.

LIGHTING AND CHARGING COILS

FROM GREEN/YELLOW TO GROUND = 0.6 OHMS. FROM BROWN TO GROUND = 0.2OHMS
FROM GREEN/YELLOW TO BROWN = 0.8 OHMS ± 10%

STANDARD CHARGING RATE WITH BATTERY INSTALLED IN MOTORCYCLE.

USE A AMPMETER WITH A 5 AMP SCLAE. DISCONNECT THE GREEN/RED WIRE FROM THE (-) SIDE OF THE BATTERY. PLUG ONE METER TEST LEAD INTO THE MALE CONNECTOR AND THE OTHER TEST LEAD INTO THE FEMALE CONNECTOR. START THE MOTORCYCLE AND OBSERVE THE METER READING AT EACH ENGINE SPEED GIVEN IN THE CHART.

CHARGE RATE WITH KEY IN "RUN "POSITION

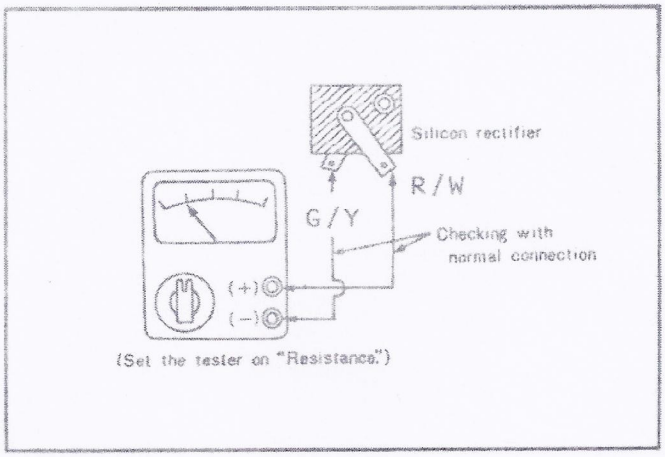
RPM	BATT CHARGE	HEAD LIGHT V. A.C.
2000	+ 0.5 AMPS	4.0 V
3000	+ 1.0 "	5.2 V
4000	+ 1.25 "	6.0 V
5000	+ 1.5 "	6.2 V
6000	+ 1.6 "	6.4 V
7000	+ 1.7 "	6.6 V

SILICON RECTIFIER

THE ALTERNATING CURRENT, WHICH IS GENERATED BY THE FLYWHEEL MAGNETO, IS RECTIFIED AND CHARGED TO THE BATTERY. FOR THIS RECTIFICATION, A SINGLE - PHASE HALFWAVE SILICON RECTIFIER IS EMPLOYED.
CHARACTERISTICS: RATED OUTPUT - 4A
RATE PEAK INVERSE WITHSTAND VOLTAGE 400 V

CHECKING THE SILICON RECTIFIER

FOR MEASUREMENTS, AN OHMMETER CAN BE USED.



HALF WAVE RECTIFIER (P/N 11115010)
(-) TEST METER LEAD TO R/W AND (+) TEST METER LEAD TO G/Y = 70,000 OHMS AND UP. (-) TEST METER LEAD TO G/Y AND (+) TEST METER LEAD TO R/W = 11.9 OHMS. ± 10%.

OPERATIONAL NOTE
THE SILICON RECTIFIER CAN BE DAMAGED IF SUBJECTED TO OVERCHARGING. SPECIAL CARE SHOULD BE TAKEN TO AVOID A SHORT CIRCUIT AND/OR INCORRECT CONNECTION OF THE POSITIVE AND NEGATIVE LEADS AT THE BATTERY. NEVER CONNECT THE RECTIFIER DIRECTLY TO THE BATTERY TO MAKE A CONTINUITY CHECK.

BATTERY
THE BATTERY IS A 6 VOLT - 4 AH UNIT THAT IS THE POWER SOURCE FOR THE HORN, TURN SIGNALS AND STOP LIGHT. BECAUSE OF THE FLUCTUATING CHARGING RATE DUE TO THE DIFFERENCES IN ENGINE R.P.M.'S, THE BATTERY WILL LOSE ITS CHARGE IF THE HORN AND STOPLIGHT ARE EXCESSIVELY USED. THE CHARGING OF THE BATTERY BEGINS AT ABOUT 3,000 R.P.M. THEREFORE, IT IS RECOMMENDED TO SUSTAIN ENGINE R.P.M.'S AT ABOUT 3,000 TO 4,000 R.P.M. TO KEEP THE BATTERY CHARGED PROPERLY. IF THE HORN AND STOPLIGHT ARE USED VERY OFTEN, THE BATTERY WATER SHOULD BE CHECKED REGULARLY AS CONTINUOUS CHARGING WILL DISSIPATE THE WATER.

1. CHECKING
   1) IF SULFATION OCCURS ON PLATES DUE TO LACK OF THE BATTERY ELECTROLYTE, SHOWING WHITE ACCUMULATIONS, THE BATTERY SHOULD BE REPLACED.
   2) IF THE BOTTOMS OF THE CELLS ARE FILLED WITH CORROSIVE MATERIAL FALLING OFF PLATES, THE BATTERY SHOULD BE REPLACED.
   3) IF THE BATTERY SHOWS THE FOLLOWING DEFECTS, IT SHOULD BE REPLACED:
      - THE VOLTAGE WILL NOT RISE TO A SPECIFIC VALUE EVEN AFTER LONG HOURS OF CHARGING.
      - NO GASSING OCCURS IN ANY CELL.
      - THE 6 V BATTERY REQUIRES A CHARGING CURRENT OF MORE THAN 8.4 VOLTS IN ORDER TO SUPPLY A CURRENT AT A RATE OF 1 AMP PER HOUR FOR 10 HOURS.

2. SERVICE LIFE
   THE SERVICE LIFE OF A BATTERY IS USUALLY 2 TO 3 YEARS, BUT LACK OF CARE AS DESCRIBED BELOW WILL SHORTEN THE LIFE OF THE BATTERY.
   1) NEGLIGENCE IN RE-FILLING THE BATTERY WITH ELECTROLYTE.
   2) BATTERY BEING LEFT DISCHARGED.
   3) OVER-CHARGING BY RUSHING CHARGE.
   4) FREEZING.
   5) FILLING OF WATER OR SULFURIC ACID CONTAINING IMPURITIES WHEN RE-FILLING THE BATTERY.

3. STORAGE

IF ANY MOTORCYCLE IS NOT USED FOR A LONG TIME, REMOVE THE BATTERY AND HAVE IT STORED BY A BATTERY SERVICE SHOP. THE FOLLOWING INSTRUCTIONS SHOULD BE OBSERVED BY SHOPS EQUIPPED WITH CHARGERS.

1) RECHARGE THE BATTERY MONTHLY; CHECK FLUID LEVEL.
2) STORE THE BATTERY IN A COOL, DRY PLACE, AND AVOID TEMPERATURES BELOW 0°C. (32°F)
3) RECHARGE THE BATTERY BEFORE MOUNTING IT ON THE MOTORCYCLE.

4. SERVICE STANDARDS

ELECTROLYTE-SPECIFIC GRAVITY AND QUANTITY	1.26-1.27,110 C.C.	AT FULL CHARGE
INITIAL CHARGING CURRENT	0.2 A FOR 25 HOURS	NEW MOTORCYCLE
CHARGING CURRENT	0.2 A FOR 13 HOURS (CHARGE UNTIL SPECIFIC GRAVITY REACHES 1.26-1.27)	WHEN DISCHARGED
REPLACING OF ELECTROLYTE	DISTILLED WATER UP TO THE MAX LEVEL LINE.	ONCE A MONTH

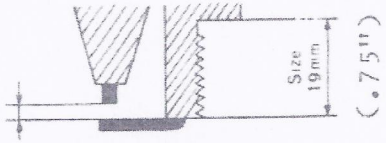
SPARK PLUG

THE LIFE OF A PLUG AND ITS DISCOLORING VARY, ACCORDING TO THE HABITS OF THE RIDER. AT EACH PERIODIC INSPECTION, REPLACE BURNED OR FOULED PLUGS WITH SUITABLE ONES DETERMINED BY THE COLOR AND CONDITION OF THE BAD PLUGS. ONE MACHINE MAY BE RIDDEN ONLY IN URBAN AREAS AT LOW SPEEDS, WHEREAS ANOTHER MAY BE RIDDEN FOR HOURS AT HIGH SPEEDS, SO CONFIRM WHAT THE OBSERVED PLUGS INDICATE BY ASKING THE RIDER HOW LONG AND HOW FAST HE RIDES, AND RECOMMEND A HOT, STANDARD, OR COLD PLUG ACCORDINGLY. IT IS NOT ECONOMICAL TO INSTALL NEW PLUGS EVERY 3,000 KM (2,00 MILES). SINCE THEY TEND TO KEEP THE ENGINE IN GOOD CONDITION AND PREVENT EXCESSIVE FUEL CONSUMPTION.

1) NORMAL AND SPARK PLUG CONDITION
   ... WHEN THE PORCELAIN AROUND THE CENTER ELECTRODE IS A LIGHT ...
2) IF THE ELECTRODES AND PORCELAIN ARE BLACK AND SOMEWHAT OILY, REPLACE THE PLUG WITH A HOTTER-TYPE FOR LOW SPEED RIDING.
3) IF THE PORCELAIN IS BURNED WHITE AND/OR THE ELECTRODES ARE PARTIALLY BURNED AWAY, REPLACE THE PLUG WITH A COLDER TYPE FOR HIGH SPEED RIDING.

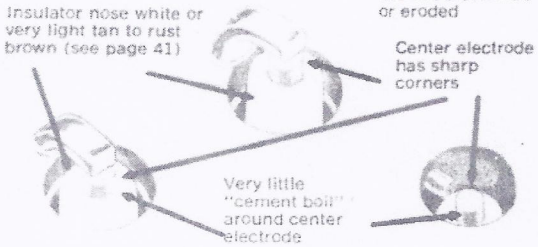
2. INSPECTION

INSTRUCT THE RIDER TO:
INSPECT AND CLEAN THE SPARK PLUG AT LEAST ONCE A MONTH OR EVERY 1,000 KM. (500 MILES).
CLEAN THE ELECTRODES OF CARBON AND ADJUST THE ELECTRODE GAP TO 0.6MM (0.024 IN)
BE SURE TO USE A STANDARD NGK B-8ES, CHAMPION N-3 OR EQUIVALENT PLUG AS REPLACEMENTS TO AVOID ANY ERROR IN REACH.



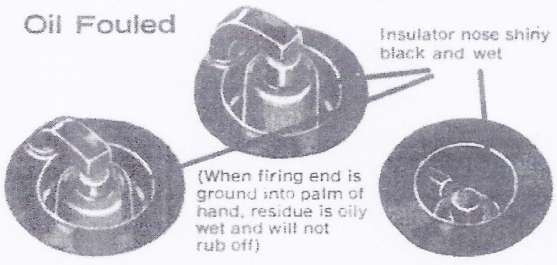
0.6MM (0.024 IN)

Normal



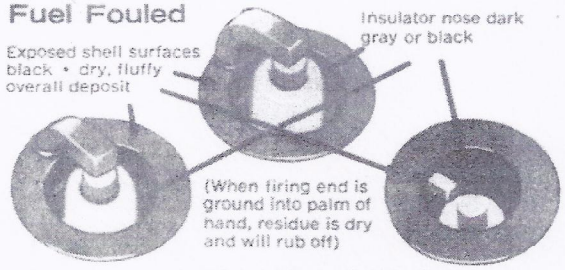
INDICATIONS: Strong Ignition • Proper Mixture
Good Oil Control • Proper Heat Range

Oil Fouled



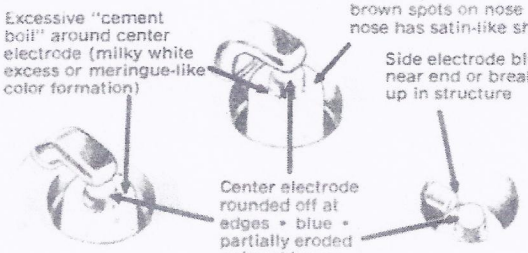
INDICATIONS: Engine Too "Loose" • Ring Not Seated
Broken Ring • Broken Valve or Spring
Valve Guide Worn • Detonation

Fuel Fouled



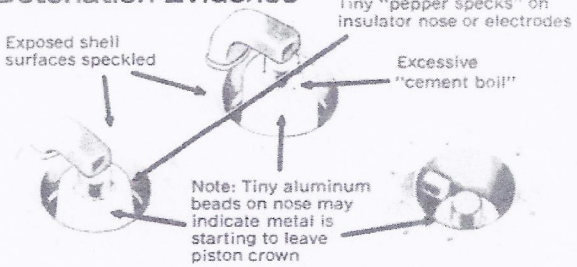
INDICATIONS: Overrich • Weak Ignition • Misfiring Plug
Wrong Heat Range • Defective Cables

Overheated



INDICATIONS: Lean Mixture • Excessive Spark Advance
Inadequate Engine Cooling • Wrong Heat Range
Detonation • Incipient Preignition

Detonation Evidence



"Spark Mark"