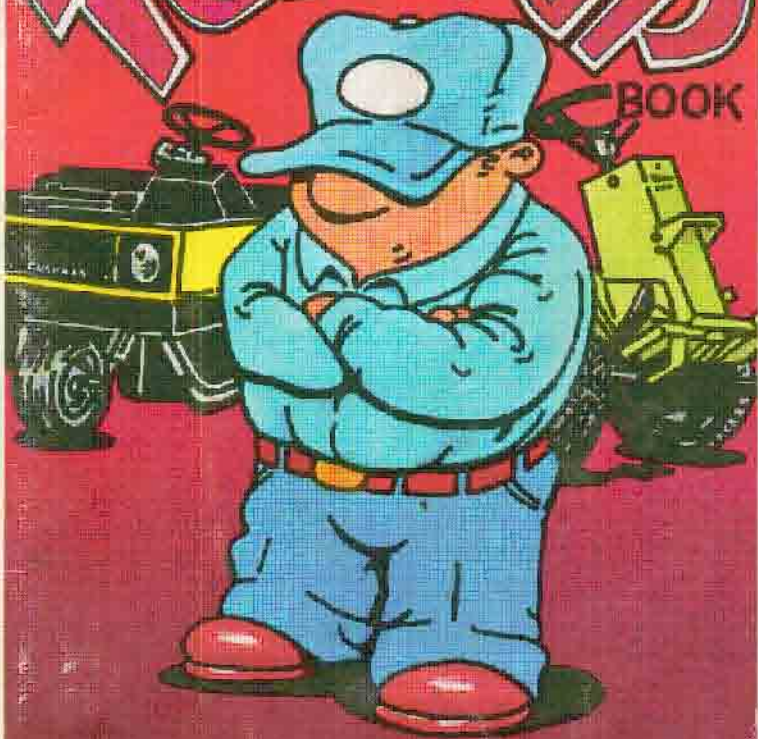


THE

CUSHMAN[®]

TUNE-UP

BOOK



**18HP. & 22HP.
GASOLINE ENGINE
FRONT LINE**

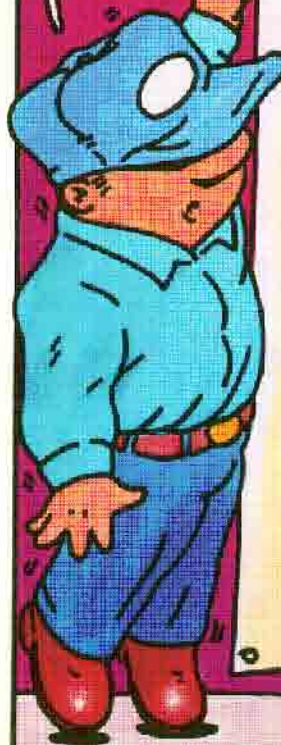
HAULSTER / TURF-TRUCKSTER

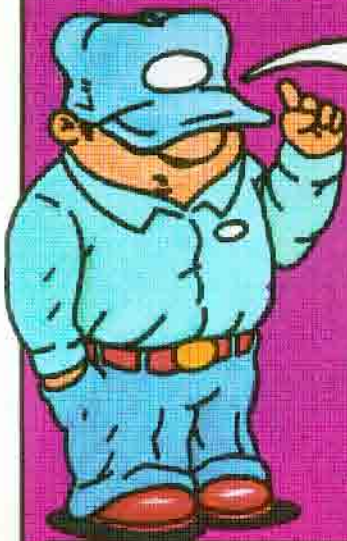
YOU'RE GONNA NEED TO HAVE THESE TOOLS READY-ALONG WITH ALL YOUR REGULAR WRENCHES 'N' STUFF! IF YA DON'T HAVE THESE TOOLS, DON'T EVEN TRY TO DO A TUNE-UP.



OKAY, YOU NEED TO DO ALL OF THE THINGS ON THIS HERE LIST. FOLLOW RIGHT DOWN THE LIST IN THE ORDER YOU SEE HERE.

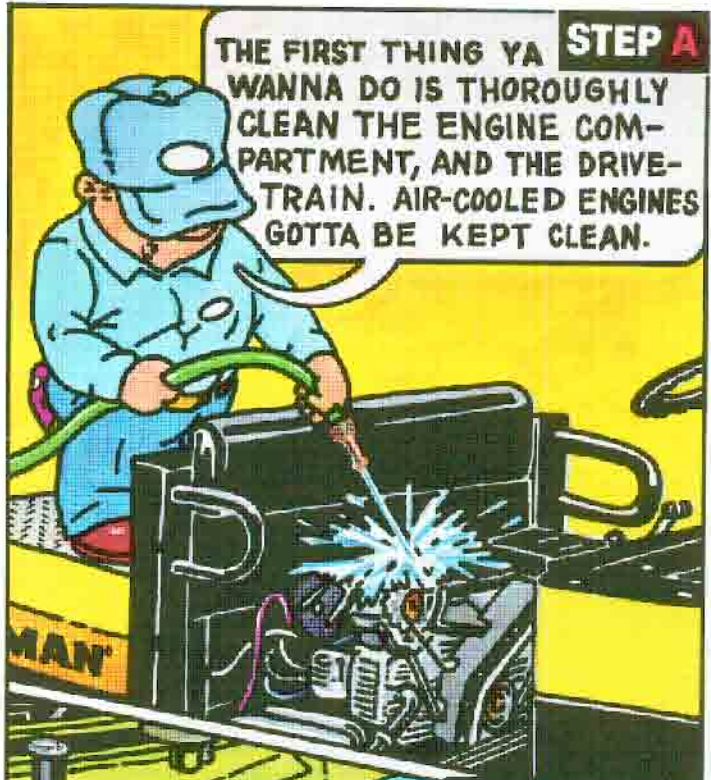
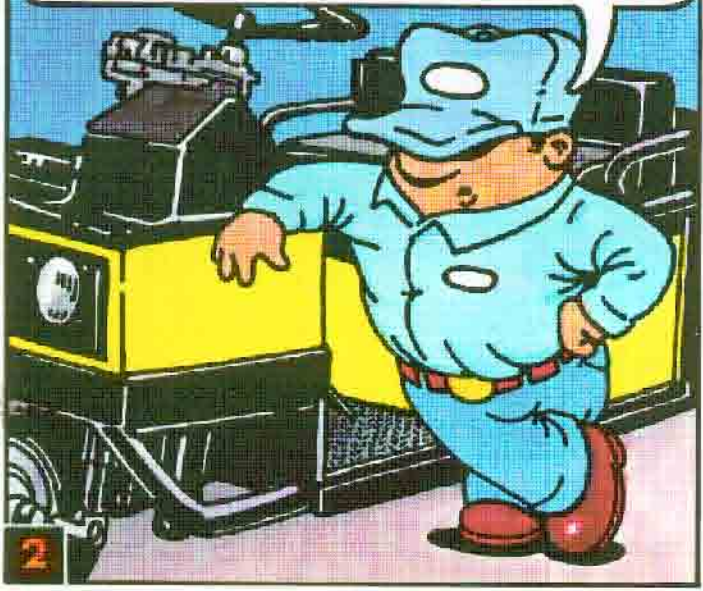
- A.** CLEAN AWAY DEBRIS & CHECK FOR DAMAGE.
- B.** CHECK VALVE LASH.
- C.** TEST COMPRESSION.
- D.** INSTALL NEW SPARK PLUGS.
- E.** INSTALL NEW POINTS & CONDENSER.
- F.** ADJUST IGNITION TIMING.
- G.** ADJUST GOVERNOR.
- H.** INSTALL NEW FUEL FILTERS.
- I.** CLEAN AIR FILTERS.
- J.** ADJUST CARBURETOR.





BEFORE YA EVEN GET STARTED, YA HAFTA GET A VEHICLE TO WORK ON - WE DIDN'T PUT THAT ONE ON THE LIST. IF IT HASN'T GOT AN 18- OR 22-HORSE CUSHMAN ENGINE, THROW IT BACK.

DON'T LET THE SIZE OF THESE BABIES SCARE YA! IT'S GOT A TWO-CYLINDER ALUMINUM DIE-CAST ENGINE MADE IN THE GOOD OL' U.S. OF A. - RIGHT IN LINCOLN, NEBRASKA, WHERE THE REST OF THE VEHICLE IS BUILT. IF YA GIVE IT A LITTLE T.L.C. (TENDER, LOVIN' CARE), IT'LL PURR LIKE A KITTEN.



THE FIRST THING YA **STEP A** WANNA DO IS THOROUGHLY CLEAN THE ENGINE COMPARTMENT, AND THE DRIVE-TRAIN. AIR-COOLED ENGINES GOTTA BE KEPT CLEAN.



ON FRONT LINE MOWERS, YA NEED TO TAKE OFF THE FAN HOUSING END-CAPS AND CLEAN OUT THE CYLINDER FINS, BECAUSE OF GRASS CLIPPINGS THE MOWER KICKS UP.

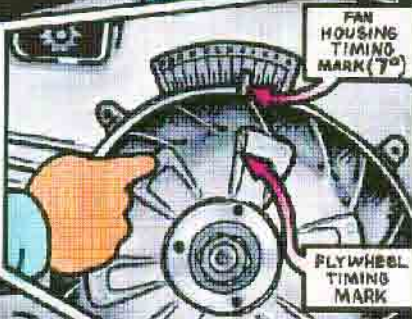


LOOK FOR OIL LEAKS AND DAMAGED PARTS. AN ENGINE WON'T STAY CLEAN IF IT HAS OIL LEAKS.

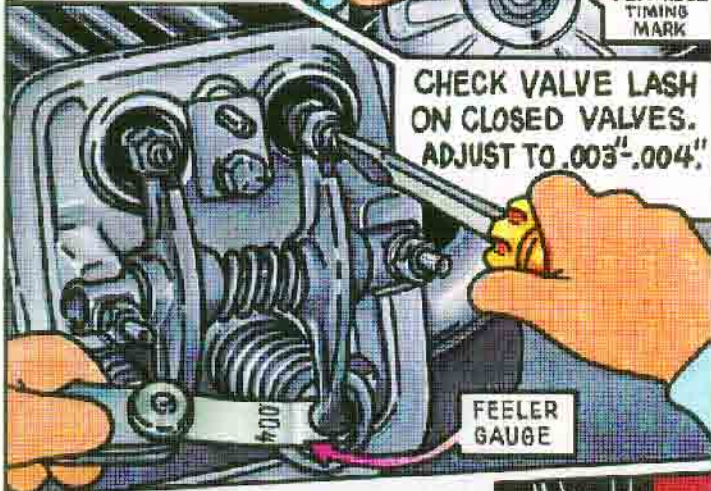
STEP B

NOW WE START WITH THE REAL MECHANICAL STUFF. WE'RE GONNA CHECK THE VALVE LASH.

LINE UP THE TIMING MARKS ON THE FLYWHEEL AND FAN HOUSING TO CLOSE THE VALVES ON ONE CYLINDER.



CHECK VALVE LASH ON CLOSED VALVES. ADJUST TO .003"-.004"



TURN ENGINE 1 FULL REVOLUTION 'TIL THE MARKS LINE UP AGAIN, THEN ADJUST THE VALVE LASH ON THE OTHER CYLINDER.



4 ALWAYS RECHECK THE CLEARANCE AFTER RETIGHTENING THE LOCKING NUTS.

STEP C

MAKE SURE YOUR BATTERY IS FULLY CHARGED FOR THIS STEP...

... PERFORMIN' A COMPRESSION TEST



WHENEVER YOU RUN THE ENGINE BE SMART AND DO THESE THREE THINGS: 1) SET PARK BRAKE, 2) SHIFT TRANSMISSION TO NEUTRAL, 3) OPEN DOOR TO LET THE EXHAUST FUMES OUT.

AFTER YOU'VE DONE THE THREE THINGS LISTED ABOVE YA NEED TO RUN THE ENGINE 'TIL IT'S WARM. THEN LET IT COOL DOWN ENOUGH TO WORK ON.



TAKE OUT BOTH SPARK PLUGS...

SET THROTTLE TO FAST...

OPEN MANUAL CHOKE ALL THE WAY!

SCREW YOUR COMPRESSION TESTER FITTING INTO THE SPARK PLUG HOLE AND OPERATE THE STARTER 'TIL THE GAUGE WON'T ADVANCE ANYMORE. THIS SHOULD TAKE ABOUT 6 REVOLUTIONS. THE READINGS YOU NEED DEPEND ON THE HORSE POWER OF YOUR ENGINE.

**5**

STEP D

THROW AWAY YOUR OLD PLUGS. USE NEW RV15 YC OR EQUIVALENT PLUGS FOR 22-HP OR 18-HP WITH PLUGS ON TOP. 18-HP WITH PLUGS ON THE BOTTOM SIDE NEED ACB5TS OR EQUIVALENT.

GAP TO .025"

... WITH A WIRE GAUGE.

GET A SHORT PIECE OF HOSE 'CAUSE IT'S FLEXIBLE AND MAKES A GREAT INSTALLATION TOOL.

STICK THE TOP OF THE PLUG INTO ONE END OF THE PIECE OF HOSE AND START THE PLUG IN THE HOLE...

SCREW

... THEN, REMOVE THE HOSE AND TIGHTEN THE PLUG WITH YOUR SPARK PLUG SOCKET.

STEP E

THIS STEP, WE'RE GONNA BE WORKIN' ON INSTALLING NEW POINTS AND CONDENSER. THEN WE'LL SET THE GAP.

CONTACT POINT SET

BREAKER PLATE RETAINING SCREW

ADJUSTING SCREW

LOOKIN' IN ON YOUR TIMER IT'LL LOOK SOMETHIN' LIKE WHAT YA SEE HERE. YA NEED TO ROTATE THE ENGINE TO OPEN THE POINTS.

SET THE POINT GAP TO .020"

STEP F

FOR THIS STEP ON TIMING, YOU'LL NEED A TACH AND A TIMING LIGHT. WE'LL BE TIMING BOTH 22- & 18-HP ENGINES.

**22 HP.****18 HP.**

ON 18-HP MODELS YOU'LL HAVE TO MEASURE TO THE LEFT OF THE CASTING MARK $1\frac{7}{8}$ " AND MAKE A SOLID MARK WITH A PENCIL.

FIRST START THE ENGINE. ADJUST THROTTLE STOP SCREW ON CARB, BRINGING ENGINE SPEED TO BELOW 700 RPM. THEN CHECK TIMING MARKS. ON 18-HP THE TWO CAST TIMING MARKS (FLYWHEEL AND HOUSING) MUST LINE UP. ON 22-HP THE CAST MARK ON THE FLYWHEEL MUST LINE UP WITH 5° ON THE DECAL.



RESET IDLE SPEED TO 900RPM, THEN ADVANCE THE THROTTLE TO FULL GOVERNED SPEED. ON 18-HP THE FLYWHEEL MARK MUST LINE UP WITH YOUR PENCIL MARK. ON 22-HP THE FLYWHEEL MARK MUST MOVE COUNTER CLOCKWISE AND STOP BETWEEN 28° & 31° MARKS ON THE DECAL. IF THE ENGINE FLUNKS THIS TEST, IT PROBABLY WON'T DEVELOP FULL POWER. GET OUT YOUR CUSHMAN SERVICE MANUAL AND READ UP ON THE TIMER/GOVERNOR. THAT'S WHERE THE PROBLEM IS.

STEP G

NOW WE MOVE ON TO THE GOVERNOR ADJUSTMENT ON BOTH 18- AND 22-HP ENGINES.



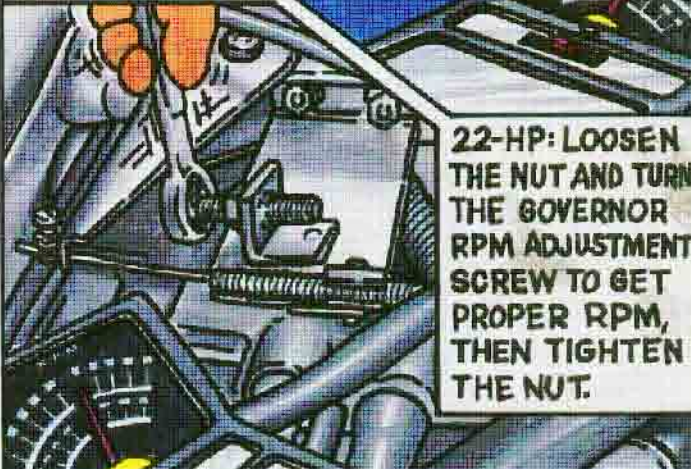
OKAY, CONNECT YOUR TACH, START THE ENGINE AND ADVANCE TO FULL SPEED.



18-HP: LOOSEN THE GOVERNOR BRACKET SCREW, MOVE THE BRACKET TO GET PROPER RPM, TIGHTEN THE SCREW TO 6-10 LBS. FT. (8-13 N-m).



22-HP: LOOSEN THE NUT AND TURN THE GOVERNOR RPM ADJUSTMENT SCREW TO GET PROPER RPM, THEN TIGHTEN THE NUT.



SET ALL FRONT LINES AT 3,550 RPM. SET ALL HAULSTERS AND TURF-TRUCKSTERS AT 3,750 RPM.

STEP H

THIS STEP H DEALS WITH THE FUEL SYSTEM, AND THERE'S A FEW THINGS I WANT YA TO BE AWARE OF, 'CAUSE THIS CAN BE SERIOUS BUSINESS IF YA AREN'T. FIRST, GASOLINE IS EXTREMELY FLAMMABLE UNDER CERTAIN CONDITIONS. SO DON'T SMOKE, AND MAKE SURE NO SPARKS OR FLAMES ARE NEAR WHEN YOU'RE WORKING ON THE FUEL SYSTEM. MAKE PROVISIONS TO CATCH ANY FUEL OVER FLOW.



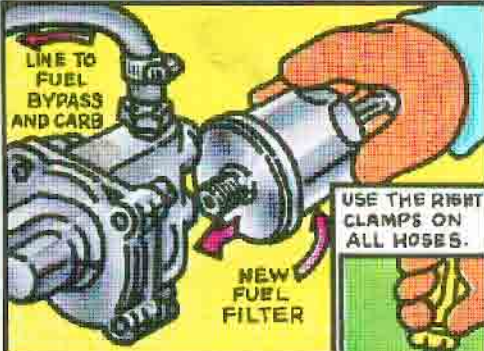
THE FACTORY INSTALLED PLASTIC CLAMPS ON THE FUEL HOSES CAN'T BE REUSED, SO THIS IS THE TYPE OF CLAMP TO USE WHEN YA REINSTALL THE FUEL HOSES. MAKE SURE YA GOT ENOUGH.

HAULSTER TURF-TRUCKSTER

FIRST REMOVE AND THROW AWAY THE OLD FILTER. THEY WILL HAVE A LITTLE GAS IN 'EM, SO PUT 'EM IN A SAFE PLACE.



INSTALL A NEW FUEL FILTER (CONNECT LINES TO FILTER AS SHOWN).



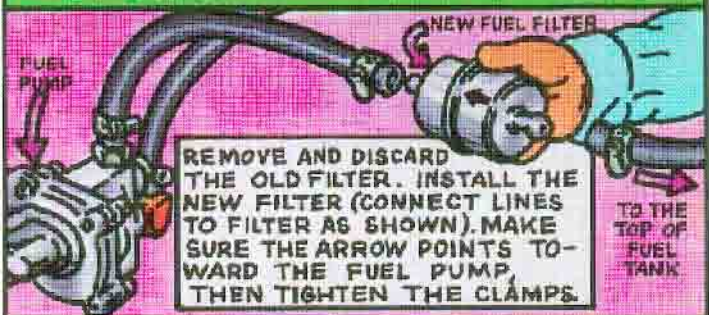
UNSCREW AND REPLACE THE FILTER SCREWED INTO THE BACK OF THE FUEL PUMP (YA CAN'T GET THIS ONE BACKWARDS).



THE FOLKS AT CUSHMAN SPENT A LOT OF TIME FINDIN' THE RIGHT FILTERS. YOU OUGHTA STAY WITH ORIGINAL EQUIPMENT FROM YOUR CUSHMAN DEALER. YOU CAN 'BUY 'EM CHEAPER, BUT NOT BETTER.

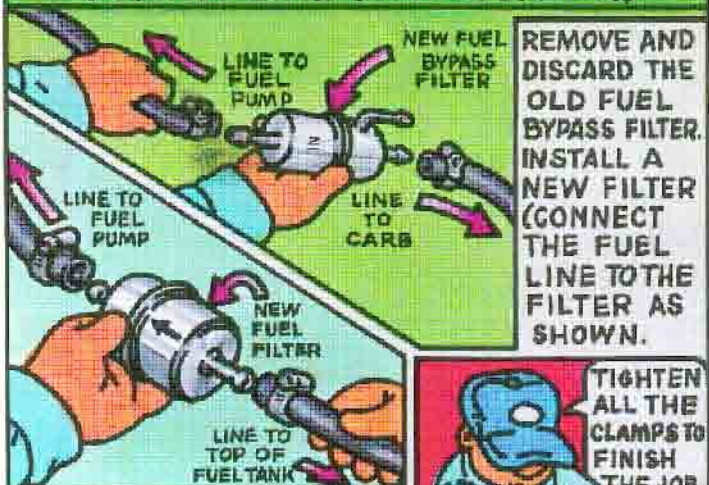
**STEP H**

HAULSTER/TURF-TRUCKSTER & FRONT LINE (THRU 8410)



REMOVE AND DISCARD THE OLD FILTER. INSTALL THE NEW FILTER (CONNECT LINES TO FILTER AS SHOWN). MAKE SURE THE ARROW POINTS TOWARD THE FUEL PUMP, THEN TIGHTEN THE CLAMPS.

FRONT LINE (8510 & LATER)



REMOVE AND DISCARD THE OLD FUEL BYPASS FILTER. INSTALL A NEW FILTER (CONNECT THE FUEL LINE TO THE FILTER AS SHOWN).

REMOVE AND DISCARD THE OLD FILTER. INSTALL THE NEW FILTER (CONNECT LINES TO FILTER AS SHOWN). MAKE SURE THE ARROW POINTS TOWARD THE FUEL PUMP.

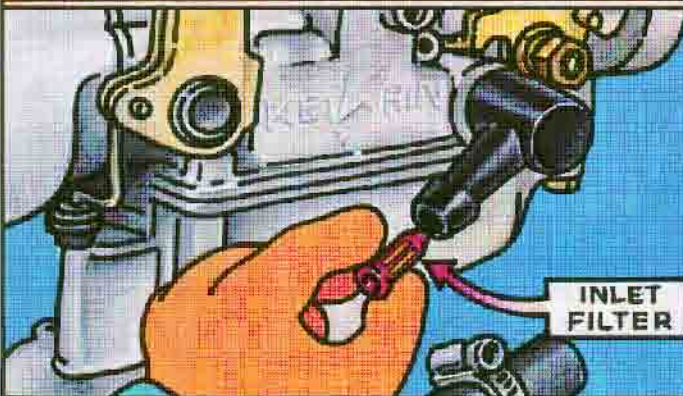


TIGHTEN ALL THE CLAMPS TO FINISH THE JOB.

STEP H

FINALLY, THIS PART OF THE STEP DEALS WITH ONE LITTLE BUT VERY IMPORTANT FUEL FILTER ON A LOT OF THE KEIHIN CARBS. REMEMBER, SIZE CAN BE DECEIVIN' I CAN VOUCH FOR THAT.

ALSO, DON'T FORGET YOU'RE STILL WORKIN' AROUND GAS, SO BE CAREFUL.

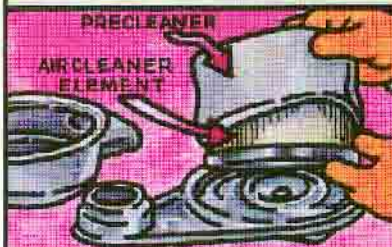
INLET FILTER ON KEIHIN CARBS

THEY HID THIS LITTLE BUGGER INSIDE THE INLET FITTING. IT'S NOT ON ALL KEIHINS, BUT YA NEED TO LOOK FOR IT. IT CAN CLOG UP THE WHOLE SYSTEM. USE A KNIFE BLADE OR SCREW DRIVER TO POP OUT THE OLD FILTER. INSTALL A NEW FILTER, AS SHOWN, REPLACE THE HOSE, TIGHTEN THE CLAMP (REMEMBER TO USE THE RIGHT TYPE) AND YOU'RE ALL SET.

OKAY, ENOUGH ON FUEL FILTERS. LET'S MOVE ON TO OTHER THINGS.

**STEP I**

AIR CLEANER SERVICE COMES IN TWO AREAS. THIS FIRST PART OF THE STEP IS ON COMBUSTION AIR. BOTH FRONT LINE AND HAULSTER / TURF-TRUCKSTER ARE INCLUDED.

**FRONT LINE****ENGINE-MOUNT AIR CLEANER****FENDER-MOUNT CLEANER****HAULSTER/TURF-TRUCKSTER**

ONLY OFF-ROAD HAULSTERS AND TURF-TRUCKSTERS HAVE PRE CLEANERS.



WASH THE PRECLEANER WITH SOAP AND WARM WATER. MOST GUYS WANT TO PUT OIL ON THE PRECLEANER. DON'T DO THIS ON A CUSHMAN OR YA MESS UP THE PAPER FILTER.



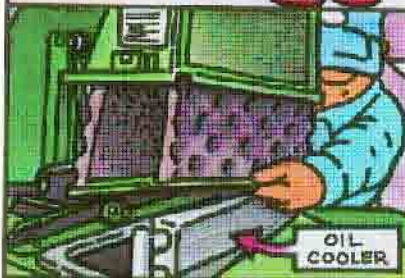
HOLD THE PAPER ELEMENT TO A LIGHT BULB-YA NEED TO SEE SOME LIGHT... BUT IF YA SEE PIN HOLES, THROW AWAY THE ELEMENT.

GENTLY TAP THE PAPER ELEMENT ON YOUR HAND TO REMOVE LOOSE DIRT. DON'T WASH THIS BABY.

WHEN YA INSTALL THE FILTERS, MAKE SURE ALL SEALS ARE UN-DAMAGED AND TIGHT. THAT'S JUST SO NO AIR GETS IN WITHOUT GOING THROUGH THE FILTER.

STEP 1

WE'RE GONNA MOVE ON TO THE ENGINE COOLING AIR, NOW. THIS IS DEALIN' WITH FRONT LINE ONLY.



TAKE OFF THE COVER AND LIFT OUT THE FILTER FRAME WITH THE FILTER ELEMENT ON IT. CHECK THE OIL COOLER FINS AND CLEAN AWAY DEBRIS THAT'S ACCUMULATED, IF IT NEEDS IT.

OIL COOLER

CLEAN THE FILTER ELEMENT REAL WELL, SPRAYIN' IT WITH A HOSE. THEN SET IT A-SIDE TO DRY NATURALLY.



FILTER FRAME & ELEMENT

THERE IS A CHANCE THAT THE ELEMENT WILL FALL APART, *@*!! SO YOU'LL HAVE TO REPLACE IT.

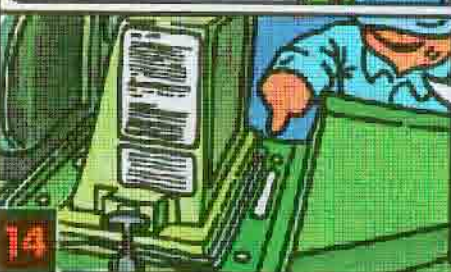
SHOT ELEMENT



WRAP THE FILTER ELEMENT OVER THE FILTER FRAME. THEN INSTALL THE RETAINER STRIP, NUTS AND BOLTS.



REPLACE THE ELEMENT, FRAME, AND SCREEN, MAKING SURE THE SCREEN COVER SEALS FULLY AROUND THE BASE.



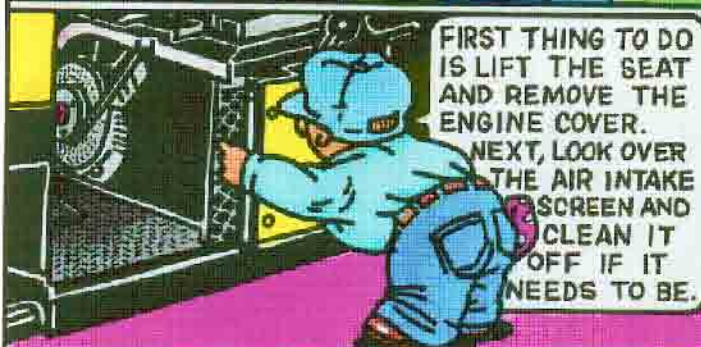
14

STEP 1

OKAY, HERE WE'RE GONNA DEAL WITH THE ENGINE COOLING AIR ON HAULSTER/TRUCKSTER MODELS.

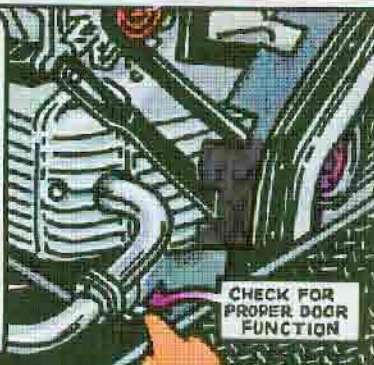


ISHMAN



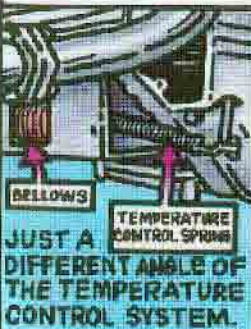
FIRST THING TO DO IS LIFT THE SEAT AND REMOVE THE ENGINE COVER. NEXT, LOOK OVER THE AIR INTAKE SCREEN AND CLEAN IT OFF IF IT NEEDS TO BE.

OPERATE THE SPRING LOADED DOORS MANUALLY TO MAKE SURE THEY WORK RIGHT. IF THEY DON'T OPEN ALL THE WAY, THE ENGINE WILL RUN HOT. IF THE BELLOWS OR LINKAGE IS BROKE, THE SPRING SHOULD HOLD THE DOOR OPEN.



CHECK FOR PROPER DOOR FUNCTION

ALLRIGHT, THE WAY THE TEMPERATURE CONTROL WORKS GOES LIKE THIS: WHEN YOUR ENGINE IS JUST STARTED AND STILL COLD, THE DOORS SHOULD BE CLOSED. AS THE ENGINE WARMS UP, THE DOORS SHOULD OPEN TO COOL THE CYLINDERS.



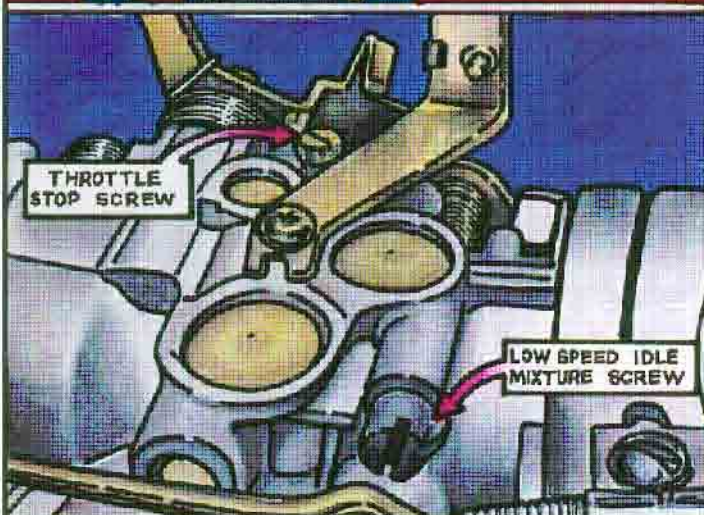
JUST A DIFFERENT ANGLE OF THE TEMPERATURE CONTROL SYSTEM.



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STEP J

THIS STEP COVERS CARB ADJUSTMENT ON ALL THE VEHICLES. FIRST, WE'LL DEAL WITH KEIHIN CARBS.



KEIHIN CARBURETORS

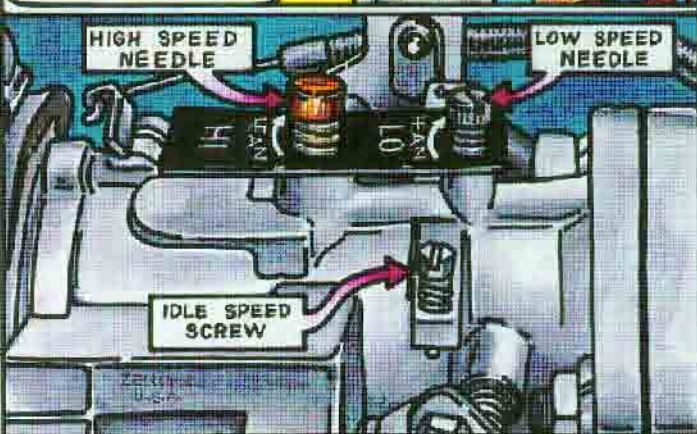
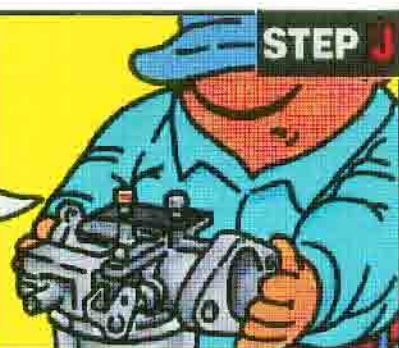
FIRST THING TO DO IS ADJUST THE LOW SPEED IDLE MIXTURE SCREW AS NECESSARY, TURNIN' CLOCKWISE FOR LEAN (ON NEWER KEIHIN CARBS YA WON'T FIND THE LOW SPEED IDLE MIXTURE SCREW).

FINALLY, SET THE IDLE SPEED BY TURNIN' THE THROTTLE STOP SCREW, CLOCKWISE WILL INCREASE THE IDLE SPEED, AND COUNTERCLOCKWISE WILL DECREASE IT. THE IDLE SPEED YOU SHOULD AIM FOR IS 900 RPM.



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FOR THOSE OF YA NOT YET FINISHED WITH THE TUNE-UP, WE NOW PRESENT THE FINAL ITEM. YA GUESSED IT, ADJUSTIN' THE ZENITH CARB.

STEP J

ZENITH CARBURETORS

OKAY, INITIAL ADJUSTMENT GOES LIKE THIS: YA OPEN THE HIGH SPEED NEEDLE TO ABOUT $1\frac{1}{2}$ TURNS. THEN OPEN THE LOW SPEED NEEDLE TO 1 TURN. NOW ADJUST THE GOVERNOR BETWEEN 3,500 AND 3,600 RPM. AFTER YA DO THAT, YA ADJUST YOUR IDLE SPEED TO 900 RPM.

ALLRIGHT, NOW FOR FINAL ADJUSTMENTS. THE FIRST THING TO DO IS TO WARM THE ENGINE UP TO OPERATIN' TEMPERATURE. WITH THE UNIT UNDER LOAD (THE P.T.O. ENGAGED), ADJUST THE HIGH SPEED NEEDLE TO OBTAIN THE HIGHEST CONSISTENT ENGINE SPEED. WATCH YOURSELF; 'CAUSE WHEN YA ENGAGE THE P.T.O. THE MOWER BLADES WILL START TURNIN'. THE LAST THING YA DO IS DISENGAGE THE P.T.O., AND LET THE ENGINE IDLE. ADJUST THE LOW SPEED NEEDLE FOR A SMOOTH IDLE. NOW YA SHOULD BE SET.



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OKAY, SO YA GOT THE TUNE-UP ALL TAKEN CARE OF. WELL, DON'T THINK YOU'RE DONE WITH THE UNIT YET. TAKE 'ER OUT AND PUT 'ER THROUGH THE PACES. MAKE SURE IT'S RUNNIN' PROPERLY BEFORE YA GO SENDIN' IT BACK TO THE OWNER.



WELL, IT'S BEEN A PLEASURE WORKIN' WITH YA, AND MAY BE WE CAN DO IT AGAIN SOON. YA KNOW THESE VEHICLES ARE QUALITY UNITS — AND HEY, IF YA ASK ME, I THINK YOU'RE A QUALITY MECHANIC.

IF YA WANT TO LEARN MORE ABOUT THE CUSHMAN ENGINE AND THE VEHICLES IT'S USED IN, THE CUSHMAN SERVICE DEPARTMENT HAS A LIBRARY OF SERVICE MANUALS. THEY ALSO BUILD ELECTRIC POWERED VEHICLES AND HAVE MANUALS ON THEM TOO.



FOR INFO, ASK YOUR DEALER OR CALL THE NUMBER ON THE BACK OF THIS BOOK. YOU WILL NEED TO TELL THEM THE MODEL NUMBER OF YOUR VEHICLE.