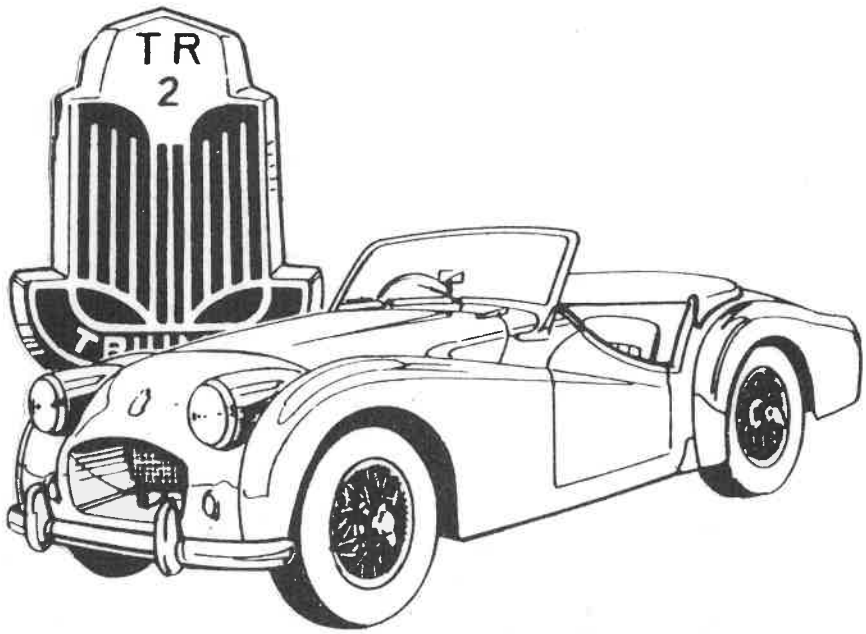
TR REGISTER AUSTRALIA



TECHNICAL TIPS.

TECHNICAL TIPS

This collection of technical articles has been collated for the benefit of TR Register members. The Committee does not endorse the articles but simply offers them as other members experiences.

A great number of the articles have been drawn from the TR Register of Southern California. Many of the articles written by the TRSC expert, Ken Gillanders, with other articles from Marty Lodawer, Jon Korbin, John Cole and others.

We have included articles from our own Bush Mechanic, Jack Evans and the Itinerant Mechanic, Darcie Reynolds and others. Exchange of these articles worldwide can only assist in maintaining the Triumph Marque.

Some of the articles refer to overseas suppliers and out-of-date prices that may no longer be current, but the main content of the articles is still very relevant.

This booklet, as with all other TR Register services, is to be sold on a non-profit basis for the use of the members.

The TR Register Committee thank you for your support, and wish you many miles of trouble free motoring. I hope you enjoy this booklet.

Gavin Rea , President
TR Register Australia
Feb 1995

CONTENTS.

PART 1

ENGINE

BRONZE VALVE GUIDES

IT SEEMS , IN MY TEN YEARS TENURE AS TECHNICAL SECRETARY WITH TRSC, THAT OUR MEMBERS AND TR OWNERS, IN GENERAL, SEEM TO FIT INTO THREE DISTINCT CATAGORIES , AS FAR AS REPAIRS GO, THEY ARE:

GROUP 1: EVERYTHING MUST BE AS ORIGINAL, EVEN IF IT IS WEAKER, TROUBLE PRONE OR EXPENSIVE.

GROUP 2 : ANYTHING GOES AS LONG AS THE CAR GOES FASTER, CORNERS BETTER OR IS MORE LIKE A RACE CAR.

GROUP 3 : THOSE THAT WANT TO KEEP THEIR CARS RUNNING AND ARE NOT OPPOSED TO AN OBVIOUS IMPROVEMENT, AS LONG AS IT DOESN'T COST TOO MUCH.

FORTUNATELY, MOST FIT INTO GROUP 3, AND HERE IS WHERE I GET INTO THIS MONTH'S SUBJECT: FOR ABOUT 5 OR 6 YEARS SILICON BRONZE VALVE GUIDES HAVE BEEN AVAILABLE FOR TR'S, HOWEVER, THE RESULTS HAVE BEEN MIXED. SOME WORK OUT EXCEPTIONALLY WELL, LAST A VERY LONG TIME AND EXTEND THE LIFE OF THE VALVE, SOME, DUE TO MANUFACTURING TOLLERENCES OR INSTALLATION, HAVE BEEN HOPELESS FAILURES AND THE CAUSE OF A GREAT DEAL OF TROUBLE.

WE CAN'T DO A GREAT DEAL ABOUT MANUFACTUR'S TOLLERANCES EXCEPT NOT TO USE THAT MAKE AGAIN, BUT WE CAN DO A GREAT DEAL ABOUT THE QUALITY OF INSTALLATION. THE HOLES BORED IN THE CYLINDER HEAD TO ACCEPT THE VALVE GUIDES DON'T VARY TOO MUCH, BUT WITH A BRONZE GUIDE, ANY DEVIATION IS DIFFCULT TO LIVE WITH. A CAST IRON GUIDE CAN BE DRIVEN INTO HOLES OF A VARIETY OF SIZES AND AS THERE IS LITTLE OR NO "CRUSH" THE INTERIOR REMAINS CONSTANT. THEY DON'T WEAR WORTH A DAMN, BUT THEY DON'T DISTORT EITHER. BRONZE VALVE GUIDES, HOWEVER, SHRINK ON THEIR INTERNAL DIAMETER ALMOST TO THE SAME EXTENT THAT THEY CRUSH. THIS CALLS FOR SOME EXTRA CARE BY WHOEVER IS INSTALLING THEM AND THEY SHOULD ALWAYS BE REAMED BACK TO STANDARD AFTER INSTALLATION. I WAS WORKING AT THE TRIUMPH CONNECTION THE OTHER DAY AND I NOTICED THAT THEY HAD ALL THE PROPER REAMERS, I GUESS YOU ONLY GET BURNED ONCE AND THEY HAVE NOW GOT ALL THE RIGHT TOOLS AND ARE VERY METICULOUS ABOUT INSTALLATION. IN CLOSING, THE BRONZE VALVE GUIDE IS A GOOD VALUE ANYTIME YOU ARE GRINDING THE VALVES AND WILL REWARD CARE OF INSTALLATION WITH YEARS OF EXTRA SERVICE.

KEN GILLANDERS - VOLUME 57, JULY 1987

LATEST ON SPARK PLUGS

THOSE OF YOU WHO HAVE BEEN AROUND TR'S LONG ENOUGH CAN REMEMBER WHEN THE CHAMPION L-10 WAS THE BEST CHOISE FOR THE TR. LATER IT WAS SUPERCEDED BY THE CHAMPION L87Y AND IN THE LAST FEW YEARS BY THE NGK BP6HS , WHICH CONTINUES TO BE THE MOST POPULAR.

HOWEVER , IT LOOKS LIKE WE HAVE A RISING STAR IN THE BOSCH PLATINUM WR87BP.

SOME OF YOU MIGHT KNOW OF MY ASSOCIATION WITH DARRYL UPRICHARD IN ENGLAND , WE HAVE BEEN SHARING TECHNOLOGY ON TR RACE ENGINES FOR SOME YEARS AND IN SEPTEMBER I SPENT SEVERAL DAYS WITH DARRYL ON HIS LATEST RACE CAR.

WE HAD BEEN RUNNING THE NEW ENGINE ON THE DYNO IN LINCOLNSHIRE ALL DAY AND WERE JUST ABOUT TO FINISH UP WHEN I DECIDED TO TRY A SET OF THE BOSCH PLATINUM WR87BP SPARK PLUGS.

WITHOUT ANY OTHER CHANGE , WE GAINED 5 BHP ON THE DYNO AND THE ENGINE RAN CLEANER!

LATER , AFTER I HAD RETURNED HOME , I TRIED A SET IN A STOCKER ON THE CLAYTON CHASSIS DYNO AND FOUND I GAINED 3 BHP. THEN I PUT A SET IN THE RED ROCKET AND I HAVE BEEN VERY SATISIFIED AS THE ENGINE APPEARS TO BE STRONGER AND RUNS CLEANER. WE WILL HAVE TO GET SOME EXPERENCE BEFORE WE WILL KNOW FOR SURE IF THE BOSCH WR87BP WILL REPLACE THE NGK BP6HS AS THE PREFERED PLUG , BUT AT THE MOMENT , THEY SEEM TO DO EVERYTHING RIGHT AND WITH A GOOD HORSEPOWER BOOST TO BOOT!

IF YOU DECIDE TO TRY THEM , WATCH FOR THE ADS AT TRAC AUTO AND GET THEM ON SALE.

ROCKER ARM ASSEMBLY REBUILD

I WOULD LIKE TO SAY THAT AS LONG AS I'VE BEEN INVOLVED WITH CAR CLUBS I HAVE NEVER LOOKED MORE FOWARD TO , OR ENJOYED READING , ANYOTHER CLUB MAGAZINE AS MUCH AS I HAVE THE TRIUMPH TRIBUNE. IT'S BEEN VERY INFORMATIVE , SO MUCH SO , IN FACT , THAT I FELT A STRONG NEED TO MAKE A CONTRIBUTION!

MY BACK GROUND IS IN LUBRICATION , I AM EMPLOYED AS DISTRICT SALES MANAGER FOR A COMPANY THAT MANUFACTURES LUBRICATION EQUIPMENT : EVERYTHING FROM SMALL GREASE FITTINGS TO A HIGHLY TECHNICAL AUTOMATED LUBRICATION SYSTEM FOR LARGE MACHINERY.

MY CONTRIBUTION HAS TO TO WITH LUBRICATION AND THE IMPORTANCE OF PROPER MACHINED TOLERANCE. I HAVE RECENTLY HAD MY ROCKER SHAFT ASSEMBLY REBUILT TO MUCH BETTER THAN NEW CONDITION. I WOULD LIKE TO SHARE THIS EXPERENCE.

WE SHOULD START WITH THE ROCKER ARM SHAFT. AFTER THIS ITEM WAS THROUGHLY CLEANED , IT WAS STRAIGHTENED TO WITHIN ONE TO TWO THOUSAND OF AN INCH (.001 - .002). THIS IS VERY IMPORTANT FOR EVEN WEAR , AND IT KEEPS THE ROCKERS FROM CAUSING SIDE STRESS ON THE VALVE STEMS , WHICH IN TURN WILL WEAR ON THE VALVE GUIDES. AFTER THE STRAIGHTENING PROCESS THE SHAFT WAS CENTERLESS GROUND . THEN HARD CROMED TO FIVE THOUSANDS (.005) OVER STANDARD THE SHAFT WAS THEN GROUND TO STANDARD TOLERANCE. THESE ADDED FEATURES PROVIDE A NUMBER OF BENEFITS , SUCH AS LONG ENGINE HOURS , AND MUCH BETTER PERFORMANCE.

THE NEXT STEM WAS TO RE-WORK THE ROCKER ARMS. THE ROCKER ARMS WERE REAMED OUT TO FIT THE PRESSING OF A SPECIAL BRONZE BUSHING USED IN HI-PERFORMANCE ENGINES. THE BUSHINGS ARE THEN DRILLED WHERE NEEDED TO ALLOW FOR LUBRICANT PASSAGE WAYS , AND THEN HONED TO FIT THE CROME HARDENED SHAFT TO WITHIN 1 5 THOUSANDS OF AN INCH (.0015). THE NEXT STEP WAS TO CHECK THE RADIUS TIP ON THE ARM THAT MAKES CONTACT WITH THE VALVE. THIS IS ALSO A CRITICAL SURFACE. IF 100 PERCENT OF THE SURFACE DOES NOT MAKE CONTACT ON THE VALVE STEM IT WILL CAUSE DOWNWARD MOVEMENT TO ONE SIDE OF THE VALVE STEM. THIS ALSO CAN CAUSE EXCESSIVE WEAR ON THE VALVE GUIDES.

WE ALL KNOW WHAT CORN VALVE GIUDES CAN OFFER. THE FINAL STEP IT TO CHECK THE ADJUSTING NUT FOR PROPER RADIUS. THIS IS ANOTHER VERY IMPORTANT MACHINE TOLERANCE , AND IF NOT CORRECT THE THREADS WILL NOT HOLD VALVE ADJUSTMENT.

BY TAKING THESE ADDITIONAL STEPS I FEEL I'VE INCREASED MY ROCKER ARM ASSEMBLIES AND VALVE GUIDE LIFE THREE TIMES OVER , AND INCREASED ENGINE PERFORMANCE AND SMOOTHNESS.

THE MACHINE SHOP THAT PERFORMED THIS RE-WORK FOR ME SPECIALIZES IN ROCKER ARM ASSEMBLIES AND HAS A REPUTATION FOR THE BEST WORK; CONTACT: GARY PATRICK

ROCKER ARM REBUILDERS

1801 BORDER

TORRANCE, CA. 90501

(213) 320-9330

JEFF TRUTTMAN - VOLUME 76, JULY 1989

6 CYLINDER ENGINE IMPROVEMENTS

TRSC NOW HAS MANY MEMBERS WITH THE 6 CYLINDER TR'S, AND QUITE A FEW ARE DUE FOR MAJOR ENGINE SERVICE. UNFORTUNATELY, THE 6 CYLINDER ENGINE (WHICH CAN TRACE ITS ANCESTRY BACK TO THE 4 CYLINDER 803 CC) SUFFERS FROM A VARIETY OF FAULTS IMPOSED UPON IT BY OUR GOVERNMENT. I AM SURE THAT THE LATE TR6 STRANGLES BY OUR SMOG LAWS, WAS NOT NEARLY AS REPRESENTATIVE OF WHAT THIS ENGINE COULD HAVE BEEN AS WAS THE 150 HP TR5, AVAILABLE TO THE REST OF THE WORLD.

FORTUNATELY, WITH THE 20 YEAR OLD "SUNSET" PROVISION OF THE 1968 CLEAN AIR ACT , IT IS POSSIBLE TO IMPROVE THE TR6 FOR THE STREET WITHOUT RUNNING AFOUL OF THE EPA.

THE INTRODUCTION OF THE 2.5 LITER 6 CYLINDER WAS A CLASSIC CASE OF BAD TIMING. WITH ITS LONG STROKE AND ITS SOMEWHAT LESS THAN POLLUTION EFFICIENT CARBURTORS , IT WAS NECESSARY TO LOWER THE COMPRESSION RATI AND SHORTEN THE CAM TIMING TO PASS EMISSION TESTING. WHAT I AM RECOMMENDING IS CORRECTING SOME OF THESE FAULTS TO IMPROVE PERFORMANCE , NOT TO BUILD A RACE CAR.

AS A GENERAL RULE, THE EARLY 6 CYLINDER HEAD CAN BE MILLED .070" WITHOUT ANY PROTEST FROM THE GAS PUMP. ENGINES AFTER CC75000E WITH THE RECESSED BLOCK , WHICH HAVE EVEN LOWER COMPRESSION , CAN USUALLY BE MILLED .100" WITHOUT PROTEST. THE STOCK PUSHRODS ARE SOLID, FLIMSY AND NOT ADJUSTABLE. BFE MAKES HOLLOW TUBE PUSHRODS WHICH ARE .100" SHORT , WHICH WILL PRESERVE THE CORRECT VALVE GEAR GEOMETRY AFTER THE HEAD IS MILLED.

THE NEXT WEAK POINT TO CONTEND WITH IS THE CANSHAFT. THE SHORTCOMMINGS HERE ARE ENOUGH TO MAKE YOU WEEP, BUT SINCE WE'RE ONLY LOOKING FOR A MILD INCREASE YOU HAVE A VARIETY OF CHOISES , ALL IF WHICH ARE BETTER THAN THE ROCK YOUR ENGINE CAME WITH.

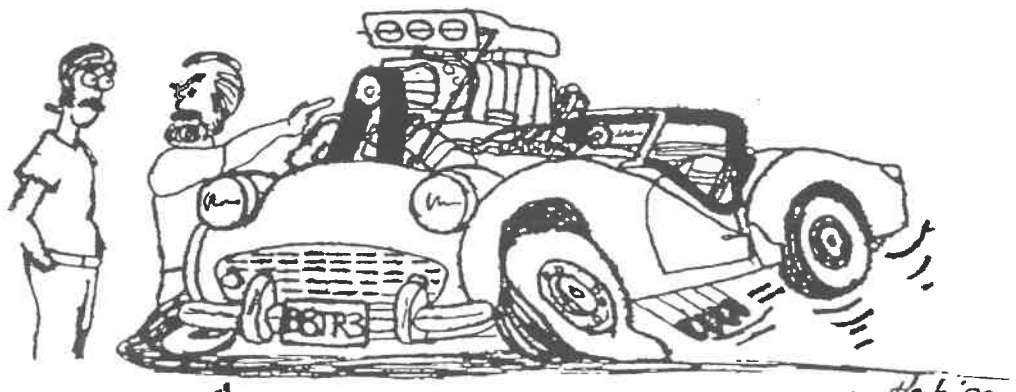
1) YOU COULD GET ONE OF THE STANDARD 125HP CAMS THAT TRIUMPH GAVE TO THE REST OF THE WORLD.

2) YOU COULD USE ONE OF THE FACTORY REGRINDES.

3) YOU COULD USE ONE OF THE AFTERMARKET REGRINDS. I HAVE FOUND THAT THE 260 DEGREE PROFILE FROM BFE IS A GOOD COMPROMISE , AND ALMOST ANY CAMSHAFT SHOULD HAVE A GOOD VALVE SPRING SET USED IN CONJUNCTION WITH IT.

YOU CAN EXPECT AROUND 120HP WITH THE USE OF THE ABOVE CHANGES , DEPENDING ON THE CAMSHAFT USED AND WHETHER OR NOT YOU REBORE THE BLOCK AT THE SAME TIME. OF COURSE , THERE IS A LOT MORE YOU COULD DO , AS THE BRITISH ROUTINELY GET 200HP + OUT OF THESE ENGINES , BUT YOU WOULDN'T WANT TO DRIVE ONE OF THESE TO THE GROCERY STORE.

KEN GILLANDERS - VOLUME 88, SEPTEMBER 1990



"BOLT-IN SWAP ?!?"

KEEPING IT TOGETHER

EVERY SO OFTEN I HAVE NOTICED THAT WE RUN ACROSS A TR THAT HAS HAD TROUBLE WITH HEAD GASKETS. I AM FORCED TO ADMIT I WAS ONE OF THOSE THAT JUST PASSED IT OFF AS : 1) HE GOT THE ENGINE TOO HOT! 2) THE GASKET WAS BAD. 3) HE JUST DIDN'T TORQUE THE HEAD PROPERLY.

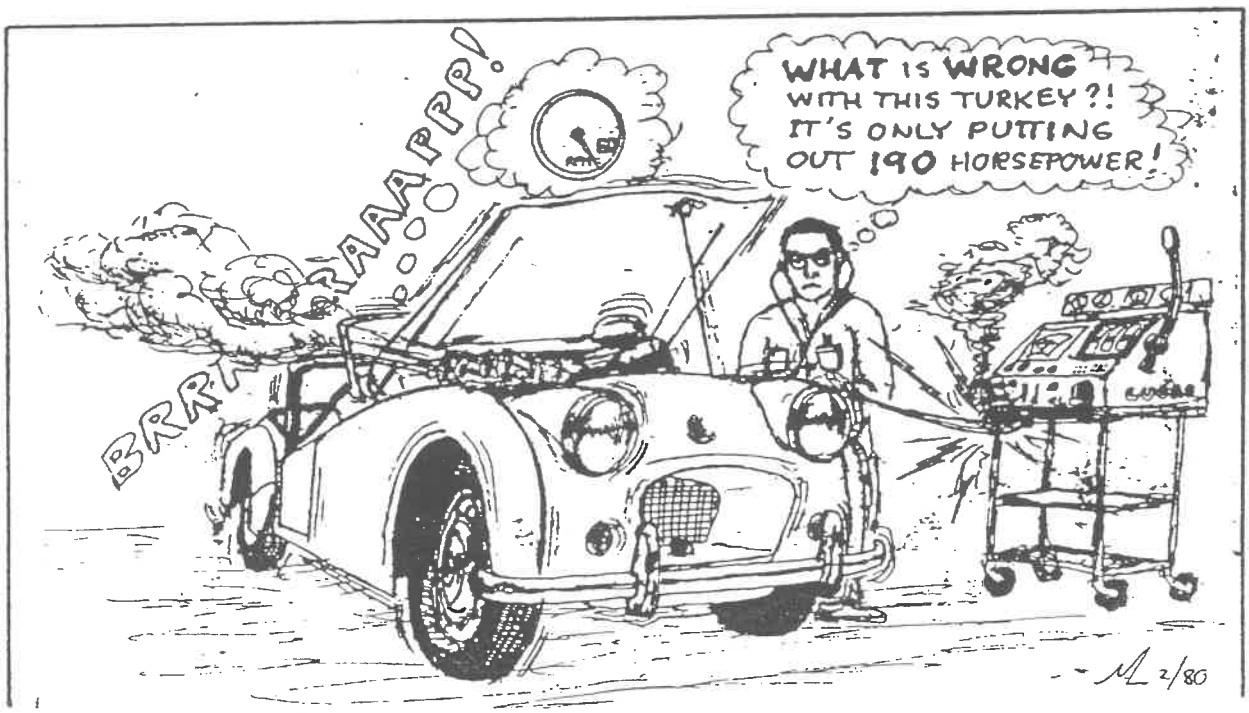
WELL , IT LOOKS LIKE I AM ONE OF THOSE CONDEMNED TO EATING OLD MG SALES BROCHURES , WITHOUT EVEN CATSUP! I RECENTLY HAD CAUSE TO REPAIR THREE TR3'S , ALL OF WHICH HAD TO HAVE THE CYLINDER HEADS REMOVED , AND ON ALL THREE I NOTICED THAT THE HEAD GASKET HAD NOT BEEN PROPERLY CRUSHED , EVENTHOUGH THE HEAD NUTS WERE TORQUED PROPERLY. ON EXAMINING THE HEAD NUTS CLOSELY I FOUND THAT THE THREAD PITCH HAD BEEN DISTORTED. THIS PROMPTED A CALL TO BOWMAN BOLT PRODUCTS AND A TRIP TO THEIR LOCAL DISTRIBUTOR WITH HEAD NUTS AND ONE STUD IN HAND.

IT SEEMS THAT STANDARD-TRIUMPH FELT THAT THE CYLINDER HEAD , HEAD GASKET AND SLEEVED BLOCK ARRANGEMENT OF THE 4 CYLINDER TR ENGINE WOULD REQUIRE A GREAT DEAL OF PRESSURE TO KEEP IT SECURE AND SO DESIGNED IT TO USE GRADE 8 STUDS , 1/2X20 THREADS , AND GRADE A NUTS. THESE TWO FASTENERS , WHEN TORQUED TO 105 FT. LBS. WOULD PROVIDE THE REQUIRED CRUSH. SO FAR , SO GOOD , ONLY EACH TIME A CYLINDER HEAD IS TIGHTENED THE TREADS ARE STREACHED A LITTLE AND ARE DEFORMED A LITTLE. AFTER ABOUT THREE OR FOUR USES THEY ARE STILL TORQUEING TO 105 FT LBS. BUT ONLY HAVE A PORTION OF THE TORQUE TRANSFERING TO PRESSURE ON THE CYLINDER HEAD AND THUS OUR HEAD GASKET PROBLEMS. ALSO , THE STOCK GRADE 8 NUT IS ONLY 1/2" THICK WITH ONLY 10 THREADS TO BEAR ON THE STUDS.

THE SOLUTION , ACCORDING TO BOWMAN BOLT PRODUCTS , IS TO CHANGE TO GRADE 9 NUTS THAT ARE ALSO TALLER , ABOUT 3/4" TALL INSTEAD OF THE 1/2" , AND HAVE 15 THREADS TO BEAR ON THE STUD INSTEAD OF THE 10. THE ONLY RUB WAS THAT BOWMAN DOESN'T SUPPLY THEM , BUT I HAVE A PRETTY GOOD SUPPLY AND AS EACH ENGINE TAKES 10 , YOU CAN EXPERT TO PAY ABOUT $8 A SET , NO MATTER WHERE YOU GET THEM , BUT THEY ARE VERY GOOD INSURANCE AGAINST HEAD GASKET FAILURE.

WHICH BRINGS UP PROBLEM #2 , ON TWO OF THE THREE ENGINES I TOOK THE HEADS OFF OF LAST MONTH , SOMEONE HAS USED 1/2" LOCK WASHERS UNDER THE HEAD NUTS INSTEAD OF THE GRADE 8 FLAT WASHERS THE WNGINE WAS BUILT WITH. THIS IS STRICTLY A NO-NO! LOCK WASHERS ARE NOT INTENDED TO TRANSFER THRUST AND AS SUCH DO A TERRIBLE JOB . IN ADDITION THEY TEAR UP BOTH THE TOP OF THE HEAD AND THE BOTTOM OF THE NUTS . BE SURE TO SAVE THOSE OLD HEAD NUT WASHERS.

KEN GILLANDERS - VOLUME 66 , AUGUST 1988



RACING IMPROVES THE BREED

I WOULD HAVE TO IMAGINE THAT , AT LEAST , THE SENIOR CITIZENS AMONG US MUST HAVE HEARD THAT "RACING IMPROVES THE BREED". HOWEVER, PERHAPS TR PEOPLE HAVE MORE PROOF OF THIS THAN ANYONE. SINCE THE TIME OUR ENGINES WERE USED IN THE STANDARD VANGUARD , THEY HAVE BEEN SUBJECT TO AN ENDLESS SERIES OF MODIFICATIONS AIMED AT BOTH POWER AND LONGEVITY INCREASES.

WE NOW ROUTINELY USE SPECIAL VALVE SPRINGS TO REPLACE THE ORIGINALS , AND 87 MM PISTON AND LINER KITS TO INCREASE THE DISPLACEMENT AND POWER. FORTUNATELY , MOST MODIFICATIONS WORK WELL ON THE STREET AS THEY DO ON THE RACE TRACK AND HAVE THE BONUS OF LONGER ENGINE LIFE.

THE TR ENGINES , WHILE AN ANTIQUE BY MODERN STANDARDS , HAS BEEN DEVELOPED TO A POINT WHERE IT STILL WINS RACES AND HAS A JUSTLY DESERVED REPUTATION FOR RELIALBILITY. EVERY SO OFTEN WE HEAR ABOUT A NEW RACER'S IDEA THAT WILL HELP , NOT ONLY THE RACERS , BUT THE AVERAGE TR OWNER AS WELL , AND SO IT IS WITH A NEW TRICK USED BY THE RACERS IN ENGLAND.

ALL OF US , AT ONE TIME OR ANOTHER , HAVE HAD THE MESSY JOB OF SEALING THE SIDES OF THE REAR MAIN BEARING CAP WITH THE FELT MATERIAL AND GASKET CEMENT. HOWEVER , WE FIND THAT YOU CAN FILL THE CAVITY ON THE SIDES OF THIS CAP WITH CLEAR SILICONE SEALANT , AND AFTER THE CAP IS ORESSED HOME , THE NOZZEL FROM THE TUBE CAN BE INSERTED INTO THE CAVITY AND ADDITIONAL SILICONE APPLIED UNDER PRESSURE TO ASSURE A GOOD SEAL. HOWEVER , THE BEARING CAP MUST BE INSTALLED BEFORE THE SILICONE IN THE CAVITIES BEGINS TO SET.

A MUCH CLEANER AND SEAIER WAY TO ACCOMPLISH A VERY MESSY TASK.

KEN GILLANDERS - VOLUME 69 , NOVEMBER 1988

NUTS AND WASHERS

RECENTLY I WAS WORKING ON A TR6 THAT HAD BEEN PREPARED FOR SHORT COURSE SOLO 1 AND OTHER COMPETITION , AND FOR THE THIRD TIME IN AS MANY RACE WEEKENDS IT HAD BLOWN HEAD GASKETS. AS I HAD ALL THREE OF THE BLOWN GASKETS I DECIDED TO COMPARE ONE AGINST THE OTHER TO SEE WHAT I COULD LEARN.

FIRST THERE WAS PROGRESSIVELY LESS CRUSH ON THE GASKET AND THE BLOWN OUT PORTION WAS BIGGER ON EACH SUCCESSIVE GASKET. CLEARLY , THERE WAS A PROBLEM WITH THE STUDS , HEAD NUTS , OR THE WASHERS. THE THREADS IN THE HEAD NUTS WERE SEVERLY DISTORTED , WHICH SHOWED THAT GRADE 8 TALL NUTS WERE NECESSARY. THE STUDS LOOKED FINE AND THEY OBVIOUSLY WERE NOT THE PROBLEM.

HOWEVER , THE WASHERS WERE ALSO CHEWED UP , AND AFTER CLOSER INSPECTION IT WAS EVIDENT THAT THEY WERE TOO SOFT AND WERE DISSIPATING THE TORQUE BEING APPLIED TO THE HEAD NUTS.

WHAT DID I LEARN ? WELL , IT IS A POOR IDEA TO USE LESS THAN GRADE 8 FLAT WASHERS UNDER THE HEAD NUTS. SECONDLY , USE ONLY THE TALL GRADE 8 NUTS , WELL LUBRICATED AND LASTLY , RETORQUE THE HEAD NUTS AFTER 500 MILES. THE ABOVE PROCEDURE SHOULD ASSIST IN GIVING YOU A DECENT LIFE FROM YOUR 6 CYLINDER HEAD GASKETS.

KEN GILLANDERS - VOLUME 92 , JANUARY 1991

FUEL LINES

IN THE VERY RECENT PAST , I MET A GUY (NON TRSC MEMBER) (CONTRIDICTION IN TERMS - ED.) WHO USED TO OWN A SHARP '59 TR3A. HE TOLD ME HOW MUCH HE MISSED HIS CAR , SINCE HE IS A TRAVELING BUSINESSMAN WHO DROVE HIS TRIUMPH. HE ALSO TOLD ME HOW HE LOST HIS CAR , AND IT HAD SOMEWHAT OF AN IMPACT ON ME AND HOW IMPORTANT ROUTINE MAINTANCE IS. HERE IS HIS STORY IN BRIEF:

ON ANOTHER TYPICAL ROAD TRIP THIS LAST SPRING , THE FUEL PUMP QUIT WORKING , WHIC.. RENDERED HIMS IMMOBLE. THE ONLY PLACE THAT COULD HELP HIM OUT WAS A "CHAIN" SUTO PARTS OUTFIT THAT SOLH HIM A 12V ELECTRICAL FUEL PUMP ($20 VARIETY) WHICH INSTALLED EASILY AND WORKED GREAT. BEFORE OUR ROADSIDE MECHANIC GOT OUT OF TOWN , HOWEVER , HE NOTICED LIGHT BLUE SMOKE COMING FROM THE HOOD VENTS WHILE STOPPED AT A TRAFFIC LIGHT. STILL IN THE INTERSECTION , HE RAISED THE HOOD AND **WHAM** , A HUGH SHOT OF SMOKE AND FLAME JUST ABOUT GOT HIM. HIS ENGINE COMPARTMENT WAS COVERED IN SMOKE AND FLAMES , AND NO FIRE EXTINGUSHER!

ALL HE COULD DO WAS STAND BACK AND WATCH AS THE FIRE WARPED THE HOOD , WORKING ITS WAY BACK INTO THE INTERIOR AND DESTROYING THE CAR.

WHAT COULD HE HAVE DONE TO PREVENT THIS ?

FIRSTLY , WE WILL BALME OUR CHEAPIE FUEL PUMP THAT JUST KEPT DOING ITS JOB , TOO WELL. FUEL COMES OUT OF THOSE GUYS AT A PRETTY FAIR PRESSURE AND IN GOOD QUANITY. THE REAR CARB FUEL SUPPLY LINE HAD BEEN BURST AND OR BLOWN FROM ITS PIPE. THE FUEL WAS THEN DIRECTED ONTO THE HOT EXHAUST MANIFOLD WHERE IT IGNITED. UNFORTUNATELY , THE ENGINE WAS NOT SHUT OFF AT THE TRAFFIC LIGHT , AND TO COMPOUND THE PROBLEM , THE HOOD WAS RAISED TO SUPPLY THE FIRE WITH PLENTY OF F 'SH AIR. THERE YOU HAVE IT -- A TR3 INFERNO !

BASED ON MY OBSERVATION OF TR'S , IT WAS AROUND THIS TIME (1959) THAT THE FUEL LINES HAD GONE FROM BRADED METAL HOSE ASSEMBLY TO A PUSH ON RUBBER HOSE TYPE OF ARRANGEMENT. THIS WAS ALSO USED ON THE EARLIER TR4'S AND IS COMPLETELY SATISFACTORY WITH THE STOCK FUEL PUMP.

THE WHOLE POINT OF ME WRITING THIS IS TO LET OWNERS BE AWARE OF A POTENTIAL HAZARD WHICH EXISTS , AND TO SUGGEST THAT A FUEL LINE INSPECTION BE INCLUDED WHEN YOU ARE UNDER YOUR BONNET.

IF YOU WANT TO CHECK YOUR FUEL LINES IN AN OPERATING SITUATION WITHOUT STARTING THE ENGINE , JUST PULL THE PRIMING LEVER ON YOUR FUEL PUMP BY HAND SEVERAL TIMES. IF THE FUEL BOWLS ARE EMPTY, YOU'LL FEEL A RESISTANCE IN THE LEVER UNTIL THEY FILL UP. ONCE THEY ARE TOPPED OFF , THE VALVES INSIDE THE LIDS WILL SHUT AND THE LEVER WILL BECOME NOTICEABLY EASIER TO OPERATE.

CHECK YOUR LINES FOR WETNESS , CRACKS , OR KINKS , AND REPLACE THEM IF NEEDED THEY REALLY DON'T COST ALL THAT MUCH.

SINCE MY CAR HAS THE OLDER BRADED FUEL LINES I DECIDED TO HAVE A NEW SET MADE BOB REINHOLD LET ME IN ON A GOOD LOCAL SOURCE CALLED DEERING INDUSTRIES (213) 595-1668. TRY THEM , THEY DO GOOD WORK. JUST TAKE IN YOUR OLD LINES AND FITTINGS , AND THEY'LL DO IT UP FOR YA !

BY THE WAY , THOSE OF YOU WHO DON'T CARRY A FIRE EXTINGUSHER YET MAY WANT TO CONSIDER THE PURCHASE OF ONE. SEARS HAS A SMALL 10 SECOND CHEMICAL BOTTLE FOR ABOUT $14. , WHICH WILL FIT BEHIND YOUR SEAT UNOBSTRUCTIVELY ... GOOD INSURANCE TO HAVE !

JOHN COLE - VOLUME 57 , SEPTEMBER 1987

DISTRIBUTORS

CAR RUNNING ERRATICALLY? POINT GAP CHANGE MYSTERIOUSLY? DOES YOUR TR OVERHEAT ONLY ON THE FREEWAY, ONLY GOING UP HILL, OR ONLY AT STOP LIGHTS? TUNE UP LASTS ONLY A SHORT TIME? IF THESE SYMPTOMS SOUND FAMILIAR, IT IS TIME TO CHECK OUT YOUR DISTRIBUTOR. THERE ARE SEVERAL PLACES IN THE TR DISTRIBUTOR THAT, AFTER 25 + YEARS OR SO, WEAR OUR (REFER TO THE TRIUMPH SERVICE MANUAL FOR A GREAT EXPLODED VIEW OF THE DISTRIBUTOR).

THE BREAKER PLATE, ON WHICH THE POINTS ARE ATTACHED, RIDES ON TOP OF THE BASE PLATE ON TWO LITTLE NYLON FEET. THE VACUUM ADVANCE MOVES THE BRAKER PLATE ONE WAY OR THE OTHER TO ADVANCE OR RETARD THE TIMING OF THE SPARK DEPENDING UPON THE NEEDS OF THE ENGINE. THEREFORE, IF THE NYLON FEET ARE BROKEN OR WORN OUT THE BREAKER PLATE MAY NOT MOVE FREELY, MESSING UP THE IGNITION TIMING. ALSO THESE DARN FEET CAN CAUSE THE BREAKER PLATE TO RIDE THE BASE PLATE AT AN ANGLE, CAUSING THE POINTS RUBBING BLOCK NOT TO CONTACT THE DISTRIBUTOR CAM SQUARELY. THIS MEANS EXCESSIVE WEAR ON THE POINTS AND SHORTENS THE LIFE OF YOUR TUNE UP.

THE VACUUM UNIT HAS A RUBBER DIAPHRAM IN IT, ATTACHED TO AN ARM TO WORK THE BREAKER PLATE FOWARD AND BACK AT LOW ENGINE SPEEDS. IF THIS DIAPHRAM HAS BECOME CRACKED IT WILL NOT IMPART ANY MOTION TO THE BREAKER PLATE, ALSO SCREWING UP THE TIMING.

AT GREATER ENGINE SPEEDS THE ADVANCE/RETARD OF THE TIMING IS ACCOMPLISHED BY THE CENTRIFICAL WEIGHTS LOCATED BENETH THE BASE PLATE. TO INSPECT THESE THE BASE PLACE CAN VE REMOVED BY FIRST SLIPPING THE VACUUM CONTROL ARM OFF ITS POST, THEN BY REMOVING THE TWO PHILLIPS SCREWS AT EITHER SIDE AND THEN LIFTING OUT THE BASE PLATE AND CONTACT PLATE ASSEMBLY. THE WEIGHTS PIVOT ON ARMS AND ARE RETRACTED BY SPRINGS. I'VE SEEN DISTRIBUTORS WITH LOOSE PIVOT ARMS AND BROKEN AND MISSING SPRINGS. IF ANY OF THESE THINGS APPLY, THIS CAN BE WHY THE CAR OVERHEATS GOING UP HILL OR ON THE FREEWAY. THE BROKEN ADVANCE MECHANISM EITHER OVER ADVANCES THE TIMING CAUSING PREIGNITION (YOU CAN HEAR THE PINGING) OR WON'T ADVANCE THE TIMING FAR ENOUGH FOR THE CAR TO DEVELOPE FULL POWER. BOTH OF THESE CAUSE OVERHEATING!

FINALLY, THE BEARING IN THE DISTRIBUTOR BODY THAT THE DRIVE ROTATES IN CAN BE WORN CAUSING THE "WOBBLIES". YOU CAN TELL THIS BY GRABBING THE CAM FIRMLY AND SHAKING HANDS WITH IT. IF IT MOVES FROM SIDE TO SIDE AT ALL IT IS PROBABLY WORN OUT. UNTIL I FELT A REBUILDT UNIT I HAD NO IDEA JUST HOW BAD MINE HAD BECOME. THE WOBBLIES CAN RESULT IN FASTER WEARING POINTS, UNEVEN POINT GAP AND THEREFORE, INCONSISTANT IGNITION DURATION, OR "DWELL". ALL THIS ADDS UP TO ERRATIC RUNNING.

IN SUMMERY, IF YOU'VE FOUND ANY OF THE FOLLOWING:

1)WORN BASE PLATE FEET.

2)BAD VACUUM UNIT.

3)WORN CENTRIFICAL ADVANCE COMPONETS.

4)WORN DRIVE BEARING.

YOU WOULDN'T BE ABLE TO GET THE CAR RUNNING RIGHT. THE EASIEST FIX IS TO GET A REBUILT UNIT AND JUST DROP IT IN, FOLLOWING THE DIRECTIONS IN THE WORKSHOP MANUAL. THE ROADSTER FACTORY USTS THEM FOR $75. I FOUND ONE LOCALLY AT G & H AUTO PARTS IN ALHAMBRA FOR $58. AND AT ASOM ELECTRIC CLAIMS TO HAVE A NEW ONE FOR $95. ASOM WILL ALSO REBUILD A REBUILDABLE CORE (WHICH PRESUMABLY COSTS LESS THAN THE PRICE QUOTED FOR THE NEW ONE). REBUILDING YOURSELF MIGHT BE POSSIBLE WITH THE PARTS FROM ASOM OR SOME OTHER LUCAS SOURCE. REMEMBER TO ASK ASOM ELECTRIC IN BEVERLY HILLS FOR THE CLUB DISCOUNT IF YOU CHOOSE TO GO TO THEM.

GENERATOR PULLEYS

WE RECENTLY HAVE NOTICES A VERY HIGH NUMBER OF GENERATOR FAILURES, PARTICULARLY ON TR'S WITH EXHAUST HEADERS. SOME OF THESE FAILURES HAVE BEEN BEARINGS, BUT MOST HAVE BEEN OVERHEATING OF THE COMMUTATOR END OF THE ARMATURE.

IT BECAME APPARENT THAT THE GENERATOR FAN, WHICH IS RIGHT BEHIND THE PULLEY, IS DESIGNED TO PULL AIR FROM THE BACK TO THE FRONT TO COOL THE GENERATOR, ACTING AS A CENTRIFUGAL PUMP TO EXHAUST THE AIR AT THE FRONT. THE PROBLEM ARISES WHEN THE EXHAUST HEADER PIPES ARE CLOSE ENOUGH TO THE BACK OF THE GENERATOR TO SUPERHEAT THE AIR BEING DRAWN THROUGH IT. NOW THE AIR NOT ONLY FAILS TO COOL THE UNIT, BUT SUBSTANTIALLY RAISES ITS OPERATION TEMPERATURE.

IF YOUR PROBLEM HAS BEEN THE REAR GENERATOR BEARING, THEN GENERALLY CLOSE ATTENTION TO LUBRICATION WILL PREVENT FURTHER DIFFICULTY. USUALLY A SHEET METAL SHIELD FITTED BETWEEN THE REAR OF THE GENERATOR AND THE EXHAUST PIPE WILL REDUCE OPERATING TEMPERATURE. OCCASIONALLY, HOWEVER, THERE JUST ISN'T ENOUGH ROOM BETWEEN THE TWO AND TO SOLVE THIS, SEVERAL AFTERMARKET GENERATOR PULLEYS ARE BEING PRODUCED WHICH REVERCES THE AIR FLOW THROUGH THE UNIT TO FRONT TO BACK. IF THESE PULLEYS APPEAR TO BE YOUR ANSWER, THEN GIVE ME A CALL AND I WILL PUT YOU IN TOUCH WITH THE MAKERS.

KEN GILLANDERS - VOLUME 58, OCT. - NOV. 1987

FAN BELTS

UNTIL RECENTLY YOU HAD A CHOISE OF USING GATES 507 FAN BELT OR A CONTINENTAL FAN BELT ON YOUR TR. THE GATES BELT WAS SUPERIOR IN QUALITY AND COULD BE CHANGED WITHOUT TOO MUCH TROUBLE. THE CONTINENTAL BELT IS MADE IN GERMANY AND ALTHOUGH IT IS WELL MADE IT IS BOTH TOO THICK AND TOO WIDE TO ALLOW IT TO BE CHANGED WITHOUT A GREAT DEAL OF DIFFICULTY. NOW TO MAKE MATTERS WORSE, THE SUPPLIES OF THE GATES 507 BELTS IS ALMOST DRIED UP. FORTUNATELY, FROM AUSTRALIA, COMES AN IDEA THAT WILL WND THIS PROBLEM.

ON SEPT.22, 1985, I WAS A GUEST OF THE TR REGISTER AUSTRALIA ON A RUN TO THE AIR CRAFT MUSEUM AT CAMDEN N.S.W.. WE ALL GATHERED AT A PARK IN PARAMATTA BEFORE THE RUN, AND AS USUAL WE ALL BEGAN EXAMINING THE CARS. I SUDDENLY NOTICED THAT ALL THE TR'S WERE RUNNING A COGGED BELT THAT RAN A LITTLE FURTHER IN THE PULLY THAN THE CONTINTAL BELT AND SEEMED THIN ENOUGH TO ALLOW IT TO BE EASLY CHANGED.

BRIAN RICHARDS TOLD ME THAT THE BEST WAS A CUMMINS DIESEL BELT #178539, AND THAT MOST TR'S IN AUSTRALIA WERE RUNNING THIS AMERICAN BELT. THE RESULTS HAVE BEEN OUTSTANDING, WITH ON FAILURES IN OVER THREE YEARS. UNLIKE MANY COGGED BELTS THEY RUN SILENTLY BECAUSE OF THEIR PATENTED COG SHAPE. THEY ARE EASIER TO CHANGE THAT THE GATES 507 AND ARE AVAILABLE AT ANY CUMMINS DEALER. I HAD TO WAITE ABOUT A WEEK FOR MINE TO ARRIVE AND IT COST ABOUT $10. A VERY GOOD SOLUTION TO A VERY NASTY PROBLEM - JUST ASK ANYONE WHO HAS HAD TO CHANGE A BELT ALONG THE SIDE OF THE ROAD!

KEN GILLANDERS - VOLUME 44, APRIL 1985

STARTER SOLUTION

AS SOME OF YOU MIGHT KNOW, DARYLL UPRICHARD OF THE TR REGISTER ENGLAND AND I HAVE BEEN EXCHANGING TECHNICAL INFORMATION FOR SONE TIME NOW. IN OUR LAST TAPE EXCHANGE DARYLL TOLD ME ABOUT A NOVEL AND VERY EFFECTIVE SOLUTION TO STARTER AND STARTING PROBLEMS.

IN ENGLAND, WHERE THE WEATHER IS OFTEN COLD, AND WHERE STARTING BECOMES A PROBLEM, THEY HAVE TAKEN TO INSTALLING TR6 STARTERS!

FIRST, THE TR6 RING GEAR IS AN EXCHANGE FOR THE ON ON THE TR3 FLYWHEEL, AND THEN WHILE THEY HAVE THE ENGINE BLOCK OUT, THEY MACHINE .125 OF AN INCH OFF THE FACE OF THE BLOCK WHERE THE STARTER MOUNTS. THIS REPOSITIONS THE STARTER PINION TO THE CORRECT DEPTH IN THE FLYWHEEL RING GEAR. NEXT THEY RUN THE PRIMARY BATTERY CABLE FROM THE BATTERY POSITIVE (OR NEGATIVE WHERE THE POLARITY HAS BEEN REVERSED) TERMINAL DIRECTLY TO THE SOLONOID TERMINAL ON THE STARTER ITSELF AND REMOVE THE ORGINIAL SOLONOID.

THIS MIGHT NOT BE THE ANSWER FOR EVERYBODY, BUT THE MUCH STRONGER STARTER MOTOR AND MUCH MORE FAVORABLE GEAR RATIO WILL REALLY SPIN THE MOTOR OVER!

KEN GILLANDERS - VOLUME 34, MAY 1985

STARTER ILL'S

I THINK SOMEHOW WE HAVE BEEN THROUGH THIS BEFORE ! A RASH OF VARIOUS STARTER PROBLEMS ALL THA ONCE , FROM A VARIETY OF SOURCES , MAKES THIS ARTICLE TIMELY.

THERE ARE TWO TYPES OF STARTERS ON EARLY TR SERIES AUTOMOBILES - THROUGH TR3B THEY ARE USUALLY REFERRED TO AS LONG TYPE AND SHORT TYPE. FOR SAKE OF SIMI ;ITY , THE DIFFERENCE BETWEEN THE LONG AND THE SHORT IS THE DISTANCE FROM THE BLOCK MOUNTING SURFACE FOWARD TO THE COMMUNTATOR END OF THE STARTER. THE EARLIER CARS HAVE LONG STARTERS (TR2 - TR3) AND THE LATER CARS HAVE THE SHORTER (TR3 - TR3B).

THE LONG STARTER HAS BEEN CONSIDERED A WEAK SISTER , BECAUSE OF THE RUBBER DRIVE UNIT THAT FAILS REGULARILY , HOWEVER , BY ITS DESIGN , IT IS REALLY A MUCH STRONGER UNIT THAN THE SHORT STARTED. THE DRIVE PINION HAS SUPPORT BUSHINGS ON BOTH ENDS AND THE LATE STARTER HAS ITS DRIVE PINION OUTSIDE THE CASE ENTIRELY , AND IS NOT SUPPORTED AT ALL ON ONE END. ONCE THE NEW HI-TECH STARTER DRIVE WAS DEVELOPED , THE LONG STARTER BECAME A MORE RELIABLE AND STRONGER UNIT THAN THE SHORT STARTER. IT USUALLY DID NOT JAMB IN THE FLYWHEEL , USED A MUCH LIGHTER FLYWHEEL AND COULD SURVIVE HIGHER CRANKING PRESSURES THAN THE SHORT STARTER.

RECENTLY THERE HAS BEEN A RASH OF THE BULLET NOSES BEING BROKEN OFF AND THE CAUSE IS USUALLY THAT THE OLD STARTER DRIVE HAS BEEN WELDED TO THE DRIVE PLATE. THIS USUALL CREATES A STARTER DRIVE THAT HITS THE RING GEAR ON THE FLYWHHEL LIKE A RUNAWAY FREIGHT TRAIN , AND AS THE STARTER CAN NOW TRANSMIT A GREAT DEAL OF CRANKING FORCE , SOMETHING HAS TO GIVE. THE BROKEN BULLET NOSE CAN BE SUC SFULLY WELDED , BUT IT WILL CONTINUE TO BREAK UNTIL THE CORRECT PARTS ARE PUT IN THE UNIT. IF YOU HAVE STARTER PROBLEMS BE SURE TO EXAMINE ALL THE OLD PARTS CAREFULLY , LOOKING FOR BROKEN OR BENT PARTS BEFORE REASSEMBLY.

KEN GILLANDERS - VOLUME 62 , APRIL 1988

LONG STARTER PARTS, PART 1

ONE OF THE MOST FAILURE PRONE PARTS IN THE EARLY TRS WAS THE STARTER DRIVE BUSH IN THE LONG STARTER. THESE PARTS CAN FAIL WITHOUT WARNING, AND IT DOES IT WILL SOULD AS IF THE STARTER DOES NOT ENGAGE THE FLYWHEEL.

THE DRIVE BUSHING WAS MADE TO ABSORBE THE INITAL SHOCK WHEN THE PINION OF THE STARTER ENGAGED THE FLYWHEEL RING GEAR. BASICLY, THE PART IS TWO CONCENTRIC METAL TUBES, ONE INSIDE THE OTHER, WITH RUBBER CAST INBETWEEN THE TUBES. THE PART COUNTS ON THE BOND BETWEEN THE RUBBER AND THE TUBES TO DRIVE THE PINION. A FRAGILE SITUATION AT BEST. TO MAKE MATTERS WORSE, THE SUPPLY HAS COMPLETELY DRIED UP AND WE UNDERSTAND THAT LUCAS WILL NOT MAKE ANY MORE.

ABOUT A YEAR AGO I BEGAN WORKING WITH JULIAN ANDREWS ON AN IMPROVED REPLACEMENT. WE NOW HAVE A NUMBER IN TEST CARS AND THEY APPEAR TO BE INDESTRUCTABLE. THESE PARTS SHOULD BE ON THE MARKET WITHIN 60 DAYS AND I'LL LET YOU KNOW WHERE YOU CAN GET ONE.

KEN GILLANDERS - VOLUME 42, FEBRUARY 1986

LONG STARTER PARTS, PART 2

AS WE DISCUSSED IN AN EARLIER ARTICLE, LUCAS HAS STOPPED MAKING THE STARTER DRIVE BUSH FOR THE EARLY STARTER AND NO FURTHER PARTS WILL BE MAED. THE SUPPLY OF THE ORIGINAL PART HAS NOW DRIED UP, BUT FORTUNATELY, ANDREW'S HI-TEC HAS BEEN COMMISSIONED TO MAKE A MUCH MORE DEPENDABLE PART TO REPLACE THE ORIGINAL. THE ANDREWS COMPRESSION DRIVE FOR THE LONG STARTER IS A "DROP IN" REPLACEMENT AND IN TESTING THERE HAS YET TO BE A FAILURE.

SO MUCH FOR THE GOOD NEWS. THE BAD NEWS IS THAT ALTHOUGH THE ORIGINAL PART COST $14, THE MUCH MORE COMPLEX REPLACEMENT COSTS $29.95. ON THE NEW UNIT ALL DRIVING FORCES ARE IN COMPRESSION RATHER THAN TENSION, AND THE NEW PART MAKES THE RELATIVELY UNRELIABLE EARLY STARTER VERY RELIABLE AND STURDY INDEED. IF YOU ARE INTERESTED IN EITHER REPAIRING YOUR EARLY STARTER OR UPGRADING, CALL ME AT (818) 448-3431, AND I WILL GET YOU ONE OF THE COMPRESSION DRIVES.

KEN GILLANDERS - VOLUME 43, MARCH 1986

THROTTLE LINKAGE CARE

IT NEVER CEASES TO AMAZE ME HOW OUR BELOVED TR'S SURVIVE OUR SOMETIMES CARELESS MAINTANCE AND SOMETHIES NON-EXISTANT MAINTANCE. THE WORST EXAMPLE OF THIS USUALLY IS THE THROTTLE LINKAGE. HOW MANY OF US HAVE SEEN PIVOT BALLS IN THE LINKAGE WORN SO FAR OUT OF SHAPE THAT THE LINKAGE JUMPS APART WITH THE SLIGHTEST NUDGE? HOW MANY OF US HAVE A BELL CRANK OR BELL CRANK PIVOT THAT IS NOT WORN ALMOST BEYOND RECOGNITION?

MOST OF THIS IS UNNECESSARY IF AT EACH SERVICE (ABOUT 2000 MILES) WE WILL TAKE AN OIL CAN AND PUT A FEW DROPS OF OIL AT EACH MOVING JOINT. WHILE YOU ARE AT IT, CHECH TO SEE IF THE THROTTLE RETURN SPRING FROM THE FIREWALL TO THE THROTTLE IS IN PLACE, YOU WOULD BE AMAZED AT HOW MANY ARE MISSING. IT ALSO WON'T HURT TO HAVE SOMEONE PUSH ON THE THROTTLE AND THEN LIFT ONE PISTON AND SEE IF THE CARBURATOR THROTTLE PLATE IS FULLY OPEN.

VERY ELEMENTARY, BUT A LITTLE CARE CAN PREVENT A LOT OF GRIEF LATER !

CRANKSHAFTS

WE HAVE AN UNUAUAL PROBLEM HERE IN THE WEST WHICH SEEMS TO BE A BY-PRODUCT OF THE LONG DISTANCES WE DRIVE OUR TR'S , AND THE HIGH SPEED OF THE FREEWAYS. WE ARE EXPERENCING MORE THAN OUR SHARE OF CRANKSHAFT FAILURES , AND THEY SEEM TO BE LIMITED TO FATIGUE BREAKS BETWEEN THE #4 CRANK PIN AND THE REAR MAIN , A SURE SIGN OF TORSIONAL VIBRATION.

WELL , THERE ARE SOME THINGS YOU CAN DO TO STOP OR GREATLY REDUCE THE PRC EM.

THE SOLUTIONS RANCE FROM HARMONIC DAMPENER CRANK HUB KITS TO PREPARATION OF THE CRANK ITSELF , AND IF YOU ARE A 'BELT AND SUSPENDER' MAN YOU CAN USE BOTH.

THE HARMONIC BALANCER FOR THE CRANK IS PART OF A KIT I HAVE AVIALABLE , BUT WE WILL CONFINE OURSELVES TO HOW TO PREPARE A CRANKSHAFT THAT YOU PLAN TO USE AS PART OF A REBUILD.

1) CRACK TEST OR "MAGNAFLUX" , COST ABOUT $10 , AND A MUST IN ORDER TO BE SURE THAT FAILURE ISN'T BUILT-IN. NO MATTER HOW SMALL THE CRACK , SCRAP THE CRANK !

2) CHECK FOR PIN WEAR , IF IT WON'T CLEAN UP AT .020 OR BETTER , DON'T WAIST MORE MONEY ON IT. FOR LIGHT USE , YOU COULD PROBABLE GET AWAY WITH .030 UNDER.

3) HOT TANK , REMOVE OIL PLUGS AND BRUSH CLEAN THE OIL PASSAGES : $16 - $20. THIS WILL INSURE THAT SLUDGE WILL NOT BLOCK OIL PASSAGES IN THE CRANK ITSELF.

4) SHOT PEEN : ABOUT $20. A MUST TO IMPROVE FATIGUE RESISTANCE AND THUS GREATLY ENTEND CRANK LIFE.

5) GR ID AND MOCRO POLISH , ABOUT $40.

6) BALANCE, ABOUT $20. TO REDUCE VIBRATION AND FATIGUE. THIS SHOULD BE DONE WITH THE FLYWHEEL , RODS , AND PISTONS.

7) CHAMPER OIL HOLES , ABOUT $20. TO IMPROVE LUBRICATION.

8) GRIND SCROLL AREA (AT REAR) TO 65 MM , ABOUT $30 . YOU ONLY NEED TO DO THIS IF YOU PLAN ON CHANGING TO THE LIP-TYPE MAIN SEAL

WITH ALL THE ABOVE PREPARATION YOU CAN EXPECT A LONG AND TROUBLE-FREE ENGINE LIFE. IT ISN'T CHEAP , BUT IT SURE BEATS DOING IT OVER SEVERAL TIMES.

KEN GILLANDERS - VOLUME 57 , SEPTEMBER 1987

CRANKSHAFTS

JUST ABOUT THE TIME WE FEEL WE HAVE SEEN IT ALL , ALONG COMES SOMETHING NEW TO SHOW HOW LITTLE WE ACTUALLY KNOW.

THE LARGEST SINGLE WORRY FOR TR OWNERS IS AND HAS BEEN ; "WHAT IF I BREAK MY CRANKSHAFT AND CAN'T GET ANOTHER ONE ?"

UP T NOW THAT HAS BEEN A VERY REAL CONCERN , STANDARD-TRIUMPH ONLY BROUGHT INTO THE US A SMALL NUMBER OF SPARE CRANKSHAFTS WHICH WERE , FOR THE MOST PART , SOLD BY 1970. HOWEVER , WE STARTED JUNKING CARS QUITE EARLY , AND THOSE OF US WHO HAVE PERSISTED WITH TR'S HAVE USUALLY BEEN ABLE TO FIND REPLACEMENTS WHEN WE HAD FAILURES. SUITEABLE SPARES HAVE BEEN HARDER AND HARDER TO FIND , AND WE QUITE LIKELY COULD HAVE BEEN IN REAL TROUBLE IN A YEAR OR TWO.

DURING A RECENT CALL TO AUTO INMPEX IN ENGLAND , THEY ADVISED ME THAT THEY HAVE A SUPPLY OF BRAND NEW CRANKSHAFTS , WHICH ARE AVAILABLE EITHER WITH REAR OIL SCROLL OR WITHOUT IT FOR USE WITH THE NEW LIP-SEAL CONVERSION.

I REALLY DON'T HAVE A FIRM PRICE , BUT I ESTIMATE THAT THE CRANKSHAFT WILL COST APPROXIMATELY $500 , INCLUDING SHIPPING (WHICH SHOULD BE CONSIDERABLE) AND THE IMPORT DUTY. THE PRICE SEEMS A LITTLE HIGH , BUT AT LEAST WE HAVE A SOLUTION SHOULD WE BE UNFORTUNATE ENOUGH TO BREAK A CRANK.

KEN GILLANDERS - VOLUME 70 , JANUARY 1989

MORE ON CRANKSHAFTS

JUST WHEN YOU THOUGHT THERE WASN'T A HELL OF A LOT MORE WE COULD WRITE ON CRANKSHAFTS , WE FINALLY SOLVE ONE OF OUR LONG STANDING PUZZLES !

EVER SINCE I HAVE BEEN WORKING ON TR'S (TWO DAYS BEFORE THE START OF TIME) WE HAVE FOUND THAT WHEN WE REBUILD THE ENGINES WE FIND A GREAT DEAL OF WEAR ON THE SIDE OF THE CONNECTING ROD JOURNAL THAT IS CLOSEST TO THE MAIN BEARINGS. WE HAVE ALWAYS , RATHER PIOUSLY , PASSED THIS OFF AS WEAR ASSOCIATED WITH POWER APPLICATION & THE MAXIUM LOAD ON THE CRANKSHAFT. HOWEVER , WE RECENTLY DECIDED TO DO A COMPUTER MODEL OF THE CRANKSHAFT , LOOKING FOR PROBLEMS TO SOLVE BEFORE THEY BIT US. WHEN THE IGNITION TIMING & BURNING TIME WERE PHASED INTO THE MODEL WE FOUND THAT WE HAD A STRANGE CIRCUMSTANCE INDEED. FIRST , WITH ABOUT 15 DEGREES IGNITION LEAD & NORMAL BURN TIME , THE MAXIUM LOAD WAS BEING APPLIED TO THE OPPOSITE SIDE OF THE CRANKSHAFT JOURNAL. FROM THE WEAR , OBVOIUSLY POWER LOAD WAS NOT THE REASON FOR THE WEAR.

WHEN WE EXAMINED THE MODEL MORE CLOSELY , WE MADE A STARTLING DISCOVERY. THE ONLY EXPLAINATION WE COULD FIND FOR OUR WEAR PROBLEM WAS THE WEIGHT OF THE PISTON & ROD ASSEMBLY.

THE ANALYSIS GOES LIKE THIS : ON EACH REVOLUTION , THE MASS OF THE PISTON & ROD MUST BE STOPPED & RE-ACCELERATED TWICE (TOP DEAD CENTER & BOTTOM DEAD CENTER) . IF YOU WILL EXAMINE A DRAWING OF THE ENGINE YOU WILL FIND THAT THE WORN PORTION OF THE CRANK PIN IS WHAT IS EXPOSED TO THE HEAVY INERTIA LOADED AT BOTH TDC AND BDC. BASICLLY THE ROD & PISTON TRY TO KEEP GOING IN THE SAME DIRECTION THEY ARE GOING , BUT THE CARNKSHAFT MUST STOP THE ROD & PISTON AND RE-ACCELERATE IT IN THE OPPOSITE DIRECTION.

TO MAKE MATTERS WORSE THE CRANKSHAFT IS MADE FROM EN4B STEEL , WHICH , IN ADDITION TO NOT BEING TOO GOOD AT DAMPENING TORSIONAL OSCILLATIONS , HAS POOR WEAR CHARACTERISTICS.

THERE ARE SOME THINGS WE CAN DO:1) RUN THE LIGHTEST PISTON & ROD ASSEMBLY , 2) HARDEN THE CRANK , 3)HARD CROME THE CRANK , 4)LITEN THE RODS , 5)CHANGE THE OIL FREQUENTLY. MOST OF THIS NEEDS TO BE DONE AT THE TIME OF REBUILD. CRANKSHAFT PREP IS MORE IMPORTANT AS ENGINE DEVELOPEMENT PROGRESSES.

KEN GILLANDERS - VOLUME 76, JULY 1989

CAMSHAFTS

NOW I CAN JUST ABOUT HEAR A LOT OF YOU SAYING "OH , NO .... NOT MORE RACING MODIFICATIONS!" WELL , I HATE TO DISSAPOINT YOU!

MANY OF US FIND THE TR ENGINE AS BUILT TO BE JUST FINE , AND WE WOULDN'T MODIFY IT EVEN IF WE KNEW HOW. WE LIKE THE SMOOTH IDLE AND THE QUIET OPERATION (HMMMM). HOWEVER , WHEN A CAMSHAFT LOBE GOES FLAT , WE ARE LEFT WITH VERY FEW ALTERNATIVES.

THE . .REE MOST OBVIOUS ONES ARE :

1) WE CAN FIND A GOOD USED STOCK CAMSHAFT.

2) WE CAN HAVE THE WORN OUT LOBE WELDED AND RE-GROUND.

3) WE CAN GET AN AFTERMARKET CAMSHAFT.

THE FIRST TWO OPTIONS ARE SELF-EXPLANATORY , BUT THE THIRD IS A VERY WIDE FIELD INDEED. AFTERMARKET CAMS COME IN SEVERAL BASIC GROUPS AND COUNTLESS SUB-GROUPS.

SO FAR AS HAVING A WORN CAMSHAFT REPAIRED IS CONCERNED , THE PRINCIPLE PROBLEM WITH HAVING A WORN LOBE WELDED AND RE-GROUND IS THAT THE SHOP GENERALLY USES ANOTHER LOBE ON THE SAME CAM AS A PATTERN. THIS OTHER LOPE WILL HAVE SOME WEAR ON IT AS WELL , WHICH THE GRINDER FAITHFULLY COPIES.

AS FOR FINDING A GOOD USED CAMSHAFT , MOST WILL HAVE SOME WEAR (HOW DO YOU THINK THEY GOT USED !) , SO WITH MODERN CAN TECHNOLOGY AVAILABLE AS AN ALTERNATIVE , THE AFTERMARKET CAM BEGINS TO LOOK LIKE THE BEST OPTION.

A LOT OF AFTERMARKET CAMS ARE SPIN OFFS OF THE ORIGINAL (ISKY 234-555, RACER BRC 1 , ETC.). THEY FOLLOW THE ORIGINAL RATES OF LIFT AND USUALLY CHANGE ONLY THE TIMING AND THE NET LIFT. ABOUT TWO YEARS AGO , AFTER BENCH RACING SESSION WITH BOB SCHALLER AND SEVERAL OTHERS AT TRIUMPHEST , I WENT TO BABE ERSON TO SEE IF HE COULD COME UP WITH AN ALL- AROUND GOOD STREET CAM WITH SMOOTH IDLE AND A VERY GOOD LOW END PERFORMANCE. THE RESULT WAS THE 260M CAMSHAFT , WHICH BRITISH FRAME & ENGINE NOW DISTRIBUTES.

BOB SCHALLER HAS USED SEVERAL OF THESE AND USES ONE IN HIS OWN CAR , AND HE HAS REPORTED EXCELLENT RESULTS.

ERSON SHOWS THE VALVE LASH AT .033 , WHICH MIGHT SEEM QUITE WIDE , BUT IT IS ALL IN THE RAMPS , AND , TO ME AT LEAST , SEEMS NO MORE NOISY THAN A STOCK UNIT. HOWEVER , ERSON SAYS THAT YOU CAN RUN TH VALVE LASH AS TIGHT AS .020 , WHICH REDUCES EVEN THE LITTLE CLATTER YOU GET AT .023 , YET CAUSES ONLY A VERY LITTLE LOSS OF ABOVE IDLE SNAP.

BOB SCHALLER PROBABLE HAS THE MOST PRACTICAL EXPERENCE WITH THIS PARTICULAR CAM , AND HE TELLS ME IT MAKES HIS TR A JOY TO DRIVE. VALVE SPRING KITS AND HEAVY DUTY PUSHRODS ARE NOT ABSOLUTELY REQUIRED , BUT ARE PROBABLY NO A BAD IDEA.

KEN GILLANDERS - VOLUME 75 , JUNE 1969

LATEST ON THE NEW OIL PUMP

SEVERAL MONTHS AGO I WROTE AN ARTICLE ON THE FACT THAT OUR LONG SEARCH FOR AN UPRATED OIL PUMP APPEARED TO BE AT AN END. WE HAD ORIGNIALLY CONSIDERED A PUMP WITH A LONGER ECCENTRIC ROTORS, BUT THIS DID NOT PROVE PRACTICLE. LATER WE CONTRACTED SEVERAL OIL PUMP MANUFACTURES IN ENGLAND WITH THE IDEA THAT PERHAPS A WHOLE NEW UNIT WAS THE WAY TO GO.

WELL, THE FIRST OF THE NEW PUMPS ARE COMPLETE AND UNDER GOING TESTING IN ENGLAND.

SO FAR THE TEST RESULTS ARE EXCELLENT. THE ORIGINAL PUMP DELIVERS 2.82 IMPERIAL GALLONS PER 1000 RPM, WHILE THE NEW PUMP DELIVERS 3.5 GALLONS PER 1000 RPM, OR AN IMPROVEMENT OF 24.1 PERCENT. THIS SHOULD BE MORE THAN ENOUGH OF A CAPASITY INCREASE TO HANDLE ANY EVENTUALLY EITHER ON THE STREET OR THE RACE TRACK.

AS OF THIS TIME WE DO NOT HAVE A FIRM PRICE FROM THE MANUFACTURER BUT THE NEW PUMP IS VERY GOOD INSURANCE AT ANY PRICE.

AN ADDITIONAL BENEFIT LOOKS LIKE IT WILL BE AVAILABLE BECOUSE OF THE NEW PUMP - IT APPEARS THAT THE NEW PUMP WILL NOT ACCEPT THE OLD OIL SCREEN AND THAT SOME TYPE OF SUBSTITUTE MUST BE FOUND, HOPEFULLY WITHOUT THE PROBLEMS OF THE OLD OIL SCREEN.

KEN GILLANDERS - VOLUME 81, JANUARY 1990

OIL SCREENS

VIRTUALLY EVERY TR2 - TR4A I TAKE APART HAS A HOLE IN THE BOTTOM OF THE OIL SCREEN WHERE IT IS SOLDERED TO THE BOTTOM OF THE PICK UP PIPE. THE DOWN SIDE TO SUCH A HOLE IS THAT A PIECE OF HARD DEBRIS CAN BE PICKED UP THROUGH THE HOLE AND GO INTO THE PUMP EITHER BREAKING THE OUTER ROTOR OR JAMMING THE PUMP.

THE REASON SO MANY ARE BROKEN IS THE INTERNAL VIBRATION OF THE ENGINE TENDS TO BREAK THE INDIVIDUAL WIRES OF THE SCREEN WHERE THEY ENTER THE SOLDER.

AS A TEMPORARY FIX IS BETTER THAN NO FIX AT ALL , WE HAVE FOUND THAT A PIECE OF .025" HALF HARD COPPER WIRE ABOUT TWO FEET LONG , IT IS POSSIBLE TO MAKE A SATISFACTORY REPAIR.

FIRST BEND A 4 INCH LENGTH INTO A FAIRLY TIGHT SENICIRCLE WITHOUT CUTTING IT OFF THE LONG PIECE AND THEN , ABOUT 1/2" CLOSER TO THE PUMP THAN THE SOLDER , WORK IT THROUGH THE OIL SCREEN , OVER THE TOP OF THE PIPE AND BACK OUT THROUGH THE OIL SCREEN NEAR THE BOTTOM . NEXT , DO THE SAME THING THROUGH THE NEXT HOLE IN THE OIL SCREEN AND DUPLICATE THE FIRST PASS. NOW YOU CAN CUT OFF THE EXTRA WIRE , BUT ALLOW ENOUGH SLACK TO WIND THE ENDS TOGETHER. ANOTHER PAIR OF WIRE PASSES SHOULD BE DONE ON THE OTHER SIDE OF THE SOLDER TO FIRMLY PRESS THE OIL SCREEN TO THE BOTTOM OF THE PICKUP TUBE.

THIS WHOLE PROCEDURE IS NOT PARTICULARLY EASY TO DO AND IT DOES REQUIRE A DEGREE OF MANUAL DEXTERITY , BUT IT IS A GOOD FIX!

KEN GILLANDERS - VOLUME 90, NOVEMBER 1990

CAN'T STAND THE PRESSURE ?

WE HAVE EXPLORED PREVIOUSLY THE SHORT COMMINGS OF THE TR OIL PUMP. AS YOU MIGHT RECALL THE MOST PERSISTANT PROBLEM HAS BEEN THE LACK OF SURPLUS CAPICITY IN THE ORIGINAL PUMP WHEN COUPLED WITH THE FACT THAT AS THE ENGINE WEARS IT'S REQUIREMENTS FOR OIL VOLUME INCREASES. THE RESULT OF THIS COMBINATION OF PROBLEMS HAS BEEN CHRONIC LOW OIL PRESSURE AT IDLE WHEN THE OIL IS HOT.

SOME OF THIS PROBLEM WAS SOLVED BY BRINGING THE ORIGINAL PUMP BACK TO MINIMUM SPECIFICATIONS AND REDUCING THE AMOUNT OF OIL UNDER PRESSURE THAT COULD BYPASS INTERNALLY IN THE PUMP. AN ADDITIONAL PORTION OF THE PROBLEM COULD BE HELPED BY BRINGING THE ENGINE'S INTERNAL CLEARANCES BACK WITHIN SPECIFICATION HOWEVER , WHILE THIS PROBLEM COULD BE MINIMIZED WITH GREAT CARE , WHAT WE REALLY NEEDED WAS A PUMP WITH MORE CAPACITY.

DARYLL UPRICHARD OF AUTO IMPEX IN ENGLAND AND I SPENT SEVERAL MONTHS ON RE-DESIGN OF THE ORIGINAL PUMP , WITH LONGER IMPELLERS , BUT WE WERE NOT ABLE TO DESIGN IN THE ADDITIONAL 30 PERCENT CAPACITY WE NEEDED. WE HAVE CURRENTLY ARRANGED FOR A TOTALLY NEW PUMP THAT DELIVERS THE FULL 30 PERCENT ADDITIONAL CAPACITY BY USING LARGER DIAMETER IMPELLERS AND WE NOW APPEARENTLY HAVE IN HAND THE OIL PUMP WE HAVE SO DESPERATELY NEEDED FOR ALL THESE YEARS !

THEY SHOULD BE AVAILABLE BY FEBRUARY 1, 1990 , BUT WE DON'T HAVE A FIRM PRICE YET.

KEN GILLANDERS - VOLUME 79 , OCTOBER 1989

REAR ENGINE OIL SEALS

ONE OF THE PRINCIPLE ANOYANCES OF THE TR IS THAT THE REAR CRANKSHAFT SEALS SEEN TO LEAK REGULARLY. WE ALL GET A LITTLE DISTURBED BY THE PATCHES OF OIL ON THE DRIVEWAY , BUT NOW IT LOOKS LIKE A SOLUTION IS AT HAND.

AUTO IMPEX IN ENGLAND HAS DESIGNED AND MARKETED A NEW ALUMINUM SEAL FOR THE REAR OF THE CRANKSHAFT THAT ARE MADE TO USE NEOPRENE LIP SEALS AGAINST THE CRANKSHAFT. HOWEVER , YOU CAN'T JUST PUT THEM IN , IT IS NECESSARY TO DO SOME ADDITIONAL GRINDING ON THE CRANKSHAFT.

IF YOU HAVE A MAJOR REBUILD IN MIND , HOWEVER , THIS KIT IS AN EXCELLENT IDEA. I DON'T HAVE AN EXACT PRICE YET , BUT I UNDERSTAND THAT IT IS ABOUT $100 OR A LITTLE LESS.

THE KIT CONTAINS THE UPPER AND LOWER ALLOY PLATES AND THE APPROPRIATE LIP SEAL. ALSO INCLUDED IS AN INSTRUCTION SHEET THAT EXPLAINS WHERE TO GRIND DOWN THE SCROLL ON THE CRANKSHAFT AND THE DIAMETER TO WHICH TO GRIND IT.

FROM WHAT I HAVE SEEN THIS APPEARS TO BE AN EXCELLENT SOLUTION TO THE CONTINOUS OIL LEAK AT THE REAR CRANKSHAFT SEAL.

I HAVE WRITTEN TO THEM AND EXPECT TO HAVE ALL THE INFORMATION SOON.

KEN GILLANDERS - VOLUME 55 , MARCH - APRIL 1987

OIL PUMP CLEARANCE

ANY ONE WHO HAS HAD A 4 CYLINDER TR FOR ANY TIME AT ALL IS AWARE THAT AFTER THE CAR HAS BEEN DRIVEN FOR SOME TIME THE OIL PRESSURE BEGINS TO GO DOWN , BOTH AT ROAD SPEED AND AT IDLE. SOME CARS , OF COURSE , ARE WORSE THAN OTHERS AND IN PREVIOUS ARTICLES WE COVERED MANY OF THE PROBLEMS AND CURES IN DEPTH. WHILE WE DID NOT OVERLOOK THE OIL PUMP ITSELF , IMPROVING THE WORKING EFFICIENCY OF THE PUMP WAS CONSIDERED BEYOND THE ABILITY OF THE AVERAGE CLUB MEMBER. ADDITIONALLY , IT WAS FELT APPROPRIATE TO GET A LOOK AT A VARIETY OF PUMPS TO SEE IF WE COULD GET A GENERAL IDEA AS TO WHY PUMPS LOST EFFICIENCY WITH AGE. IN THE LAST YEAR I HAVE TAKEN 12 PUMPS APART TO RECORD THEIR CONDITION AND I FOUND THAT THE PUMPS WITH THE POOREST OUTPUR HAD AT LEAST ONE THING IN COMMON.

THE MANUAL LISTS THE CORRECT END PLAY OF THE ROTORS AS .0005" TO .0015". OF THE 12 CHECKED , THE LEAST END PLAY WAS .005" , AND THERE WERE FOUR WITH .010" OR MORE. AS A GENERAL RULE THE MORE END PLAY , THE WORSE THE PERFORMANCE. THE BEST WAY TO REDUCE THE END PLAY , AND THERE BY REDUCE THE INTERNAL LEAKAGE AND IMPROVE PERFORMANCE , IS WITH A SHEET OF GLASS ON THE BENCH WITH A SHEET OF #600 GRIT WET OR DRY SAND PAPER LAID ON IT , GRIT SIDE UP.

BY WORKING FIRST THE END PLATE OVER THE SAND PAPER UNTIL ALL THE SURFACE MARKS ARE GONE. YOU CAN GET A VERY FLAT AND POLISHED SURFACE. THEN TAKE THE PUMP HOUSING , TAKE OUT THE ROTORS AND WORK DOWN THE LOWER SURFACE OF THE PUMP HOUSING UNTIL THE DESIRED CLEARENCE IS OBTAINED , USUALLY ABOUT .001" AT BEST

YOU CAN CHECK YOUR WORK AS YOU GO BY USING PLASTIGAGE BETWEEN THE COVER AND THE END OF THE ROTORS , BEING CAREFUL TO DRAW UP THE COVER BOLTS EVENLY. WHEN YOU CHECK THE FLATTENED PLASTIGAGE AGAINST THE RULE ON THE PACKAGE YOU SHOULD LOOK FOR A WIDTH THAT MATCHES .001". AFTER YOU ARE DONE , LUBRICATE THE ROTORS WITH ENGINE OIL AND ASSEMBLE. BE SURE TO USE A LARGE SCREW DRIVER TO CHECK HOW FREELY THE PUMP TURNS. WUUALLY A VERY GOOD RESULT IS OBTAINED FOR THE LIBERAL USE OF ELBO GREASE AND PARIENCE.

SPIN - ON OIL FILTER CONVERSIONS

ABOUT FOUR OR FIVE YEARS AGO I WROTE A COLUMN ON CONVERTING FROM STOCK CANISTER OIL FILTER TO A SPIN-ON FILTER. HOWEVER , OVER THE NEXT SEVERAL YEARS WE BEGAN TO DISCOVER SEVERAL FALL-OUT PROBLEMS WITH THE ORIGINAL CONVERSION KIT

FIRST , THE CENTER STEM USED A LARGE NUT TO HOLD THE CONVERSION BASE IN PLACE , BUT AS THE LARGE NUT WAS THREADED ONTO THE CENTRAL STEM , IT WAS POSSIBLE FOR THE STEM ITSELF TO THREAD TOO FAR INTO THE BASE , WHICH DID NOT LEAVE ENOUGH THREADS SHOWING TO HOLD THE SPIN-ON FILTER SECURELY.

SECOND , IF YOU TRIED THREADING THE SMALL DIAMETER END A LITTLE LESS IN A EFFORT TO LEAVE MORE THREADS FOR THE OIL FILTER , THEN THE ADAPTER BASE WAS NOT SECURE.

NOW THESE CONVERSION KITS HAVE BEEN MODIFIED IN THAT THE LARGE NUT IS NO MADE AS PART OF THE STEM , AND THE SMALL DIAMETER THREADED PORTION OF THE STEM IS LONGER. THIS MAKES A MORE SECURE ARRANGEMENT. THE NEW CONVERSION KIT SELLS FOR BETWEEN $18 AND $19 , BOTH AT MOSS MOTORS AND BRITISH FRAME & ENGINE , AND THIS IS A GOOD VALUE. A VARIETY OF FILTERS WILL FIT INCLUDING LEE 400 AND 400A MOTORCRAFT 400 , AND MOST FILTERS THAT FIT THE '88 - '89 TAURUS V6

KEN GILLANDERS - VOLUME 74 , MAY 1989

CAN'T TAKE THE PRESSURE !

SO THERE I WAS , MOTORING ALONG AT A SPRIGHTLY GAIT WHILST ENJOYING ALL THAT WIND IN THE FACE AND EXHAUST ROAR , WHEN A ROUTINE GLANCE AT THE INSTRUMENTS BROUGHT FORTH SOME ALARMING NEWS. THE OIL PRESSURE GAUGE HAD SUDDENLY DROPPED AND WAS READING BARELY OVER 20 PSI !

PULLING UP TO A HALT , THE READING WAS PRACTUALLY ZERO. WHAT'S THE DEAL ??

THEF WERE NO OMINOUS NOISES OR OTHER SIGNS OF TROUBLE ... EVERYTHING STILL SOUNDED FINE , **HMMMMM.**

LOOKS LIKE WE HAD BETTER OPEN IT UP AND FIND OUT WHAT'S WRONG.

STARTED OUT WITH THE OBVIOUS STUFF FIRST. ALL THE OIL LINE CONNECTIONS LOOKED GOOD AND THERE WERE NO APPARENT LEAKS. WELL , PERHAPS THE OIL PUMP HAS GONE BAD. ! PULLED THE PAN AND REPLACED THE OIL PUMP WITH A GOOD SPARE. FIRE IT UP AND **VOILA ! NO CHANGE ! HMMMMM.**

TELEPHONE CALL TO TECHNICAL SECRETARY KEN GILLANDERS : " WHAT'S THE DEAL?" KENS' FIRST QUESTION: "ARE YOU USING CASTROL OIL IN YOUR CAR?"

"WHY , YES?"

"PROBABLY YOUR PRESSURE RELIEF VALVE IS NOT SEATING PROPERLY AND CAUSING THE PRESSURE LOSS."

HOW RIGHT HE WAS !

WHAT HAD HAPPENED WAS THE OIL PRESSURE VALVE INSIDE THE OIL FILTER HEAD STUCK PARTIALLY OPEN AND CAUSED THE PRESSURE TO DROP. KEN TOLD ME THAT HE HAS SEEN THIS OCCUR COUNTLESS TIMES OVER THE YEARS , AND THE ONE COMMON FACTOR WAS THE E OF CASTROL GTX OIL..

NOW I'VE USED THE STUFF FOR THE LAST EIGHT YEARS WITH NO PRIOR PROBLEM , BUT THIS TIME IT SURE SEEMED TO FIT THE PATTERN. APPARENTLY DUE TO CHEMICAL MAKEUP OF THIS OIL , IT CAN LEAVE A STICKY RESIDUE WHICH CAN CAUSE THE VALVE TO NOT SEAT PROPERLY. IT IS EASY TO REMEDY ONCE YOU KNOW WHAT TO LOOK FOR.

THE SOLUTION IS SIMPLY TO REMOVE THE RELIEF VALVE ASSEMBLY FROM THE FILTER HEAD, CLEAN IT THROUGHLY WITH DEGREASER , SUCH AS GUNK OR CARB CLEANER , AND REPLACE IT. IT ONLY TOOK A FEW MINUTES TO DO THIS , AND ONCE COMPLETED , THE OIL PRESSURE CAME BACK TO NORMAL.

THE VALVE ASSEMBLY IS LOCATED ON TOP OF THE FILTER HEAD AS YOU LOOK INTO THE ENGINE COMPARTMENT , AND WILL BE SEEN AS A LARGE SCREW WITH TWO LOCKNUTS AT ITS BASE LOOSENING THE LOWER (OR LARGER) NUT WILL PULL THE ENTIRE ASSEMBLY OUT FOR CLEANING. I FOUND THAT IT WAS EASIER TO GET TO IT AFTER FIRST REMOVING THE COIL FROM THE ENGINE BLOCK. ONCE YOU HAVE REMOVED IT YOU CAN DISASSEMBLE IT THE ON THING TO BE CAREFUL OF HERE IS TO NOTE HOW FAR IN THE LARGE SCREW IS POSITIONED YOU'LL WANT TO BE CERTAIN TO REPLACE IT EXACTLY THE SAME WAY SO AS TO NOT TAMPER WITH THE OIL PRESSURE ADJUSTMENT.

ONCE YOU HAVE MARKED IT YOU CAN UNDO THE UPPER (OR SMALLER) LOCKNUT . REMOVE THE SCREW COMPLETELY , WHICH GIVES YOU ACCESS TO THE STEEL BALL AND SPRING CLEAN THESE PARTS THOROUGHLY AND NOTE THEIR CONDITION. NEW SPRINGS ARE AVAILABLE FROM SUPPLIERS LIKE THE ROADSTER FACTORY AND MOSS MOTORS IF YOURS LOOKS BAD YOU CAN REPLACE IT , WHICH WILL DO WONDERS FOR THE PROPER OPERATION OF THE VALVE. AFTER THESE PARTS HAVE BEEN CLEANED THEY CAN BE DIPPED IN CLEAN OIL AND REPLACED , AGAIN MAKEING SURE YOU REPLACE THE ADJUSTING SCREW WXACTLY AS IT HAD BEEN

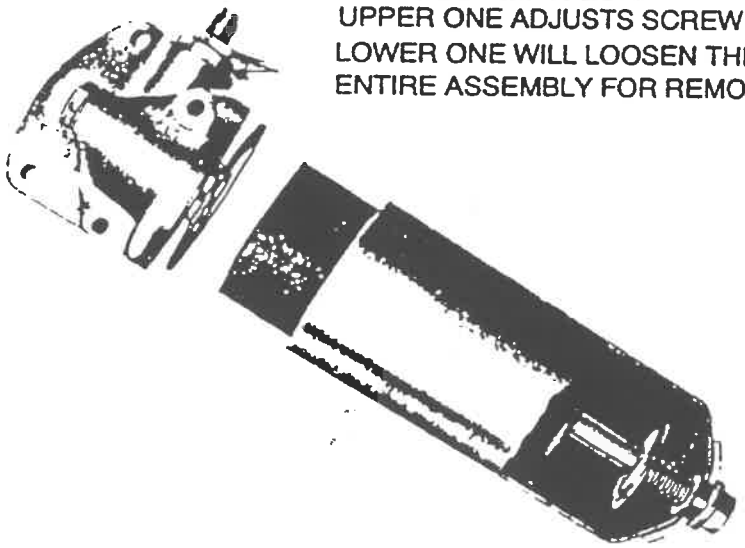
MY CAR HAS BEEN RUNNING HAPPILY EVER AFTER SINCE DOING THIS, AND I'M STILL USING CASTROL GTX OIL.

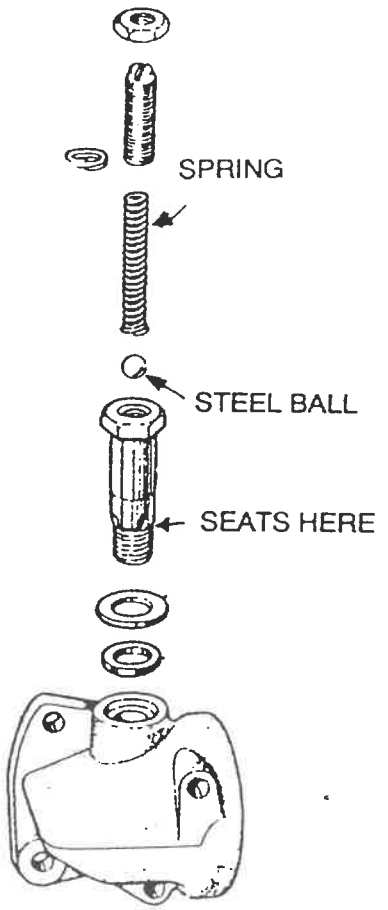
MARTY LODAWER - VOLUME 73 , APRIL 1989

BE SURE ADJUSTMENT OF
SCREW IS NOT ALTERED

LOCKING NUTS

UPPER ONE ADJUSTS SCREW
LOWER ONE WILL LOOSEN THE
ENTIRE ASSEMBLY FOR REMOVAL





OIL LEAKS !

YES , I KNOW THAT A TR THAT DOESN'T LEAK IS SIMPLY A TR THAT DOESN'T HAVE ANY MORE FLUID IN IT . BUT IT DOES NOT HAVE TO BE THAT WAY. THE TR CAN LEAK FROM A VARIETY OF PLACES , SO WE WILL LOOK AT THE LEAKS AND THE CURES ONE AT A TIME.

THE MOST GENERAL LEAK IS THE REAR MAIN SEAL. SOME HOW THEY ALL SEEM TO DRIP E FROM THE RATHER PRIMITAVE REVERSE SCROLL SLINGERS USED TO CONTROL THE LEAKAGE. THERE ARE SEVERAL POSSIBLE CURES THAT RANGE FROM REFITTING THE ORIGINAL SCROLLS WITH THE FACTORY POSITIONING TOOL AS OUTLINED IN THE SHOP MANUAL , TO MACHINEING OFF THE SCROLL FROM THE CRANKSHAFT AND FITTING A LIP-SEAL . BOTH ARE MAJOR JOBS AND WHILE REFITTING THE ORIGINAL SCROLLS IS A SOMETIMES THING THE LIP-SEAL SEEMS TO BE A MORE POSITIVE FIX.

AT THE BACK OF THE BLOCK , BEHIND THE FLYWHEEL , IS A FREEZE PLUG AT THE END OF THE CAMSHAFT REAR BEARING BORE. UNFORTUNATELY , THE OIL LEAKS FROM THE SAME GENERAL AREA AS THE REAR MAIN AND I KNOW OF SEVERAL ENGINES THAT WERE DISMANTLED TO REPAIR REAR MAIN LEAKS THAT LEAKED EVERY BIT AS MUCH WHEN THEY WERE TAKEN APART AS NO ONE CHECKED THE CAMSHAFT PLUG , WHICH IS WHERE THE LEAK WAS. WHEN INSTALLING A NEW PLUG ALWAYS COAT THE EDGES WITH A GOOD GASKET SEALER , AND IT CERTAINLY DOES NOT HURT TO PUT IN A SECOND PLUG BEHIND THE FIRST, IF THERE IS ROOM.

A MORE UNCOMMON LEAK CAN ORIGINATE WITH THE THREE BOLTS THAT HOLD ON THE GENERATOR BRACKET. IF ONE OF THE THREE BOLTS THAT COMMUNICATES WITH THE CRANKCASE WERE TO FALL OUT YOU MIGHT THINK YOU HAD STRUCK OIL. BESIDES IT CAN EMPTY A SUMP IN NO TIME AT ALL. AN EFFECTIVE CURE IS TO DRILL THE HEADS OF THE BOLT TO ACCEPT SAFETY WIRE AND COAT THE THREADS WITH GASKET SEALER BEFORE BOLTING THE BRACKET TO THE BLOCK. A 1/16" DRILL WILL ACCEPT MOST SOFT IRON WIRE AND BE SURE TO TIE ALL THREE BOLTS TOGETHER TO PREVENT ANY FROM BACKING OUT. LOCTITE STUD LOCK WILL USUALLY DO A GOOD JOB WITHOUT THE SAFETY WIRE, BUT THE THREADS IN THE BLOCK AND THE BOLT MUST BE CAREFULLY CLEANED FIRST

CONTINUED NEXT ISSUE ....

KEN GILLANDERS - VOLUME 90, NOVEMBER 1990

HARRY WEBSTER'S* ART SCHOOL

* HARRY DESIGNED THE TR-3

MAKE YOUR OWN TR-3 CARTOONS - IT'S EASY!

(PROFILE IS THE EASIEST - WE'LL START WITH THAT)

Step 1: FRONT WHEEL ARCH

Step 2: TOP OF FENDER — PARALLEL TO ARCH

Step 3: FINISH FENDER LINES — BOTH STRAIGHT

Step 4: BACK FENDER TOP LINE — SAME AS STEP 2

Step 5: BACK WHEEL ARCH — SAME AS STEP 1

Step 6: FINISH BACK FENDER

Step 7: ADD HOOD + COWL

Step 8: ADD WINDSHIELD + HEADLIGHTS

Step 9: ADD WHEELS

Step 10: ADD BUMPERS + STONE GUARDS

Step 11: DETAILS:
- TAIL LIGHT
- BACK COWL
- GAS CAP
- DOOR OUTLINE (ADD HANDLE FOR 3A)
- FENDER MIRROR
- STEERING WHEEL

Step 12: FILL-IN TIRES
ADD SHADING UNDERNEATH

... AND THERE YOU ARE! G. Hedes 82

GAME , SET , AND MATCH

NE SATURDAY AFTERNOON, WHILE DOING SOME WORK ON THE TR , THE TELEPHONE ANG - T WAS A LONGTIME TRSC MEMBER WHO WAS UP TO HIS ELBOWS IN HIS FRIST ARBURETOR REBUILD ! THE STORY GOES LIKE THIS

20 A M

ART M) - "HELLO ? "

ODD (T) - "HI MARTY, ITS TODD "

- "WHAT'S HAPPENING MY GOOD MAN ?"

- "WELL , I'M REBUILDING MY CARBURETORS FOR THE FIRST TIME THESE THINGS REALLY REN'T THAT BAD WHEN YOU GET THEM ON THE WORKBENCH I DO HAVE A COUPLE OF UESTIONS THOUGH -- MAYBE YOU COULD HELP ME OUT ?"

- "SURE , I'LL DO MY BEST - FIRE AWAY "

- "WELL, MY CAR HAS BEEN RUNNING REALLY BAD AND I DECIDED TO REBUILD THE CARBS Y FIRST QUESTION IS ABOUT TUNING THEM AFTER THEY ARE BACK TOGETHER - HOW ARD IS THAT REALLY ?"

- "NOT VERY , THE TUNING IS NOT THAT DIFFICULT, FOR SYNCHRONIZATION, ALL YOU EALLY NEED IS A UNI-SYN TOOL "

- "WELL, I DON'T HAVE ONE , IS IT POSSIBLE TO DO IT WITHOUT THAT ?"

- "YEAH , IT IS IN THE OLD DAYS THEY USED A PIECE OF RUBBER HOSE WHICH IS PLACED T THE THROAT OF THE CARB AND THE OTHER END HELD UP TO YOUR EAR . THIS WAY YOU AN DJUST EACH CARB UNTIL THE VACUUM HISS SOUNDS THE SAME IN EACH ONE I'VE EVE TRIED THIS , BUT I UNDERSTAND THE OLDTIMERS COULD GET THOSE CARBS WITHIN MICRON OF EACHOTHER USING THIS METHOD. ANYWAY, YOU CAN GET THEM CLOSE BY ISUAL CHECK OF THE HEIGHT OF THE PISTONS WHILE IDLING AND LISTEN FOR MATCHING ISS VOLUME "

- "WAIT A MINUTE, WAIT A MINUTE ! I'M WRITING ALL THIS AS FAST AS I CAN I THINK I'LL UST GO OUT AND BUY A UNI-SYN ANOTHER PROBLEM I'M HAVING IS ONE OF THE CLAMPS HAT LINK THE THROTTLE SHAFTS OF THE CARBS TOGETHER HAS BROKEN , WHERE CAN I

T - "GET ANOTHER ONE ?"

M - "OH, NO WONDER THE CAR HAS BEEN RUNNING SO BADLY , IT WAS ONLY RUNNING ON ONE CARBURETOR ! ALL YOU NEED IS ANOTHER USED CLAMP AND I KNOW WHO COULD HELP YOU OUT THERE - ALBERT "

T - "OH YEAH , GREAT ALBERT'S CLOSE BY , I'LL CHECK IT OUT "

M - "SOUNDS GOOD , GIVE ME A CALL IF YOU HAVE ANY OTHER PROBLEMS GOOD LUCK "

12 37 P M

M - "HELLO ?"

T - "MARTY , IT'S TODD I'M MAKING PROGRESS HERE , ITS GOING PRETTY GOOD ALBERT FOUND ME A CLAMP AND THE CARBS ARE BACK TOGETHER AND ON THE CAR I HAVE A NEW PROBLEM THOUGH . WHEN I PUMPED UP THE CARB WITH FUEL I NOTICED FUEL POURING OUT THE DRAIN TUBE ON THE FLOAT CHAMBER LID ON THE FRONT CARB ANY IDEAS ?"

M - "WELL, IT SOUNDS LIKE THE NEEDLE VALVE INSIDE THE LID IS STICKING DID YOU REPLACE IT DURING THE REBUILD ?"

T - "NO , IT WAS OKAY BEFORE , IT JUST LOOKED A LITTLE WORN.

M - "WELL, MY GUESS IS , EITHER SOME DIRT IS INTERFERING WITH THE SEATING OF THE NEEDLE , OR PERHAPS , IT WAS INSTALLED INCORRECTLY - SOMETIMES THE NEEDLE CAN BE INSTALLED UPSIDEDOWN . I'M SURE IT IS GOING TO BE ONE OR THE OTHER "

T - "OKAY , I'LL TAKE ANOTHER LOOK AT IT ONCE THAT'S FIXED I CAN TRY THE TUNING."

M - "SOUNDS GOOD ! GIVE ME A CALL IF YOU HAVE ANY OTHER QUESTIONS GOOD LUCK!"

2:00 P.M.

M - "HELLO ?"

T - "HEY MARTY, IT'S TODD ."

- "WELL YOU'RE RIGHT ABOUT THE FLOAT CHAMBER YEP I MANAGED TO PUT THE EEDLE IN UPSIDEDOWN AFTER COMPARING THE OLD AND THE NEW NEEDLES THEY /ERE QUITE DIFFERENT IN APPEARENCE ONCE I REVERSED THE NEW NEEDLE AND ERITTED IT THE LEAK STOPED INSTANTLY "

- "OH , TERRIFIC I LIKE IT WHEN THAT STUFF IS EASY "

- BAN TRYING THE SYNCHROIZATION BIT WHEN I NOTICED THAT THE PISTON IN THE RONT CARB WAS NOT DROPPING FREELY . INSTEAD OF DROPPING WITH A SOFT CLICK , KE THE BOOK SAYS , THIS ONE IS HANGING UP JUST BEFORE IT HIT BOTTOM . WHAT MIGHT E CAUSING THIS ?"

- " WELL, THAT CONDITION USUALLY INDICATES THAT THE BRASS JET IS NOT QUITE ENTERED AROUND THE NEEDLE UNDERNEATH THE PISTON. THE NORMAL PROCEDURE IS O LOSEN THE LARGE NUT UNDERNEATH THE CARBURETOR WHICH HOLDS THE JET IN LACE , THIS ALLOWS THE JET TO BE MOVED SLIGHTLY UNTIL IT ALIGNS PERFECTLY WITH HE NEEDLE IT'S A TRIAL AND ERROR PROCESS , AND YOU MAY HAVE TO REPEAT IT EVERAL TIMES TO GET IT RIGHT . THERE IS ONE HING YOU MIGHT TRY FIRST THOUGH , IF OU LOOSEN THE 3 SCREWS THAT HOLD THE DASH POT COVER IN PLACE YOU WILL BE BLE TO SHIFT THE POSITION OF THE COVER A LITTLE BIT IF THE MISALIGNMENT IS VERY IGHT , THIS TECHNIQUE MAY BE SUFFICIENT TO DO THE TRICK. IT IS SURE LESS WORK , SO O SUGGEST TRYING THIS FIRST "

- "JUST A MINUTE , I'M TRYING THIS RIGHT NOW ..... LET'S SEE ..... I CAN MOVE IT JUST A BIT AH , THAT LOOKS LIKE IT !"

- "GREAT, NOW HOLD THE COVER IN POSITION WITH ONE HAND WHILE YOU'RE TIGHTENING HE SCREWS DOWN . IF THE PISTON STILL DROPS FREELY AFTER YOU'VE TIGHTENED IT , HEN OU'RE ALL SET "

- "BINGO ! IT WORKS PERFECTLY NOW . HOW ABOUT THAT !"

- "ALRIGHT , NOW YOU'RE READY TO GO THROUGH WITH THE SYNCHROIZATION DJUSTMENT BE SURE THE ENGINE IS WARMED UP BEFORE YOU START (THIS HOLDS RUE FOR AY CARB ADJUSTMENTS) . THE ADJUSTMENT IS MADE WITH THE TWO CARBS DISCONNECTED , SO DON'T TIGHTEN UP YOUR NEW CLAMP JUST YET TO ADJUST, TURN THE

- "IDLE SCREW ON THE LEFT SIDE OF EACH CARBURETOR ADJACENT TO THE THROTTLE SHAFT . CLOCKWISE INCREASES IDLE SPEED AND COUNTERCLOCKWISE DECREASES IT WITHOUT A UNI-SYN , YOU'LL BE WATCHING THE PISTONS FOR HEIGHTH , AND LISTENING TO THE HISS OF EACH CARBURETOR . THE IMPORTANT THING IS TO TRY TO GET BOTH CARBS THE SAME HEIGHTH AND SOUND I TRY TO BACK OFF ON EACH IDLE SCREW UNTIL THE IDLE IS A LOW AS POSSIBLE WITH THE CARBURETORS STILL BALANCED (BETWEEN 800 AND 1000 RMP). DOES ALL THIS MAKE SENSE SO FAR ?"

T - "YEAH , I THINK I'M WITH YOU."

M - OKAY , NOW BEFORE YOU GO TO DO YOUR MIXTURE ADJUSTMENT BE SURE TO PUT YOUR AIR CLEANERS BACK ON "

T - "OKAY , BUT THE BOOK SAYS SOMETHING ABOUT LIFTING UP THE PISTON SLIGHTLY WITH A KNIFE BLADE OR SCREW DRIVER TO CHECK IT HOW DO YOU DO THAT WITH THE AIR CLEANERS ON ?"

M - "OH , YOU DON'T HAVE TO WORRY ABOUT THAT KNIFE STUFF , THE FACTORY PROVIDED A MUCH BETTER METHOD IF YOU LOOK BETWEEN THE CARB ITSELF AND THE FLOAT CHAMBER YOU WILL FIND A SMALL BUTTON POINTING DOWNWARD "

T - "HANG ON . YEAH, I'VE GOT IT ."

M - "OKAY, NOW BY PUSHING THAT BUTTON UPWARD THE PISTON WILL BE RAISED JUST THE RIGHT AMOUNT FOR THE MIXTURE TEST."

T - "THAT'S TERRIFIC ! "

M - "NOT BAD , EH ? NOW TO ACTUALLY CHECK THE MIXTURE , RUN THE ENGINE UP TO OPERATING TEMPERATURE , THEN AT IDLE , PRESS THE BUTTONS ONE AT A TIME THE ENGINE SHOULD CONTINUE TO RUN NORMALLY FOR A FEW SECONDS , THEN BEGIN TO DROP OFF IN IDLE SPEED. IF THE ENGINE REVS UP WHEN YOU PUSH THE BUTTON THAT INDICATES THAT THE MIXTURE IS TOO RICH. IF THE ENGINE ABRUPTLY DIES OUT, THEN THE MIXTURE IS TOO LEAN TO ADJUST EACH CARBURETOR , YOU MUST TURN THE ADJUSTING NUT AT THE BOTTOM OF THE CARBURETOR . TURNING TO THE RIGHT (SCREWING TOWARD THE CARBURETOR BODY) WILL MAKE THE MIXTURE LEANER , NOW TURNING TO THE LEFT (BACKING IT OUT FROM THE CARB BODY) WILL MAKE RICHER THE MIXTURE . TURN THE NUT

GAME , SET , AND MATCH continued .... ..

M - ONLY ONE 'FLAT' AT A TIME , UNTIL THE CARBURETOR PASSES THE BUTTON TEST NOW YOU CAN LINK THE CARBURETORS TOGETHER BY TIGHTENING YOUR NEW CLAMP BE CAREFUL THOUGH , BECAUSE TIGHTENING THE CLAMP CAN ALTER THE SYNCHRONIZATION YOU WILL NEED TO DOUBLE CHECK IT (REMOVING THE AIR CLEANERS) TO SET THE FINAL IDLE SPEED YOU CAND USE THE MASTER ADJUSTING SCREW ON THE FRONT CARBURETOR IDEALLY , THE IDLE SHOULD BE BETWEEN 700 AND 800 RPMS. HOWEVER , MOST CARS WILL NOT IDLE THAT LOW DUE MAINLY TO WORN THROTTLE SHAFTS , SO ANYTHING UNDER 1000 RPMS IS ACCEPTABLE DOES THAT MAKE SENSE ?"

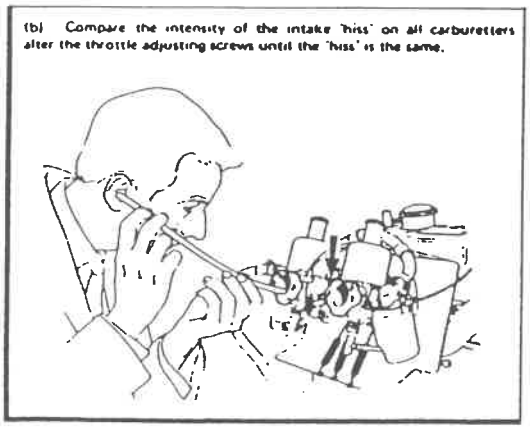
T - "YEAH , I THINK I'VE GOT IT I'M GOING TO TRY IT OUT RIGHT NOW."

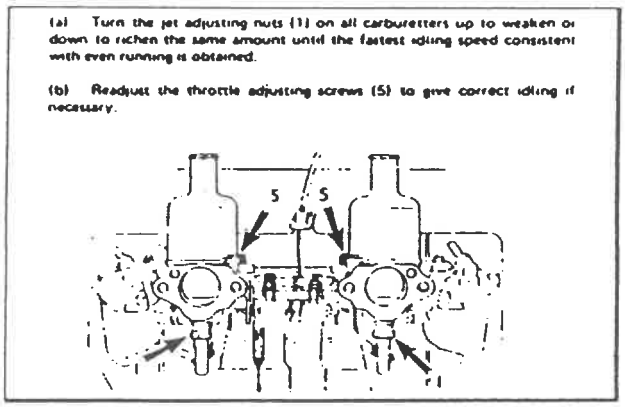
M - "SOUNDS GREAT, TODD I HOPE I'LL SEE THIS NEWLY-TUNED MACHINE ONE OF THESE DAYS AT AN EVENT "

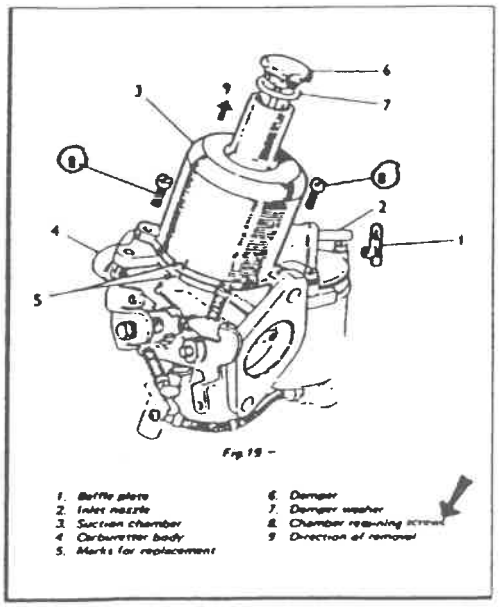
T - "YEAH ALRIGHT I'LL LET YOU KNOW WHAT HAPPENS."

MARTY LODAWER -- VOLUME 85 , MAY 1990

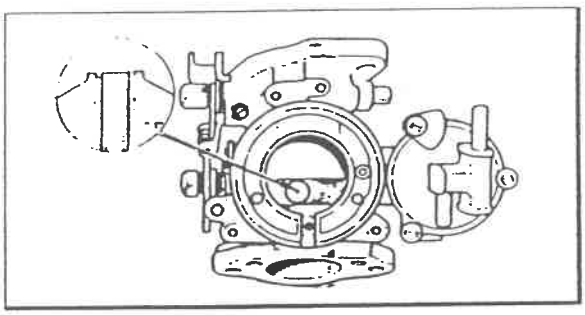
(ILLUSTRATIONS REPRINTED FROM
"TUNING S.U. CARBURETTERS"







LOOSENING SCREWS (#8) AND ROTATING DASHPOT DOME SLIGHTLY MAY HELP.



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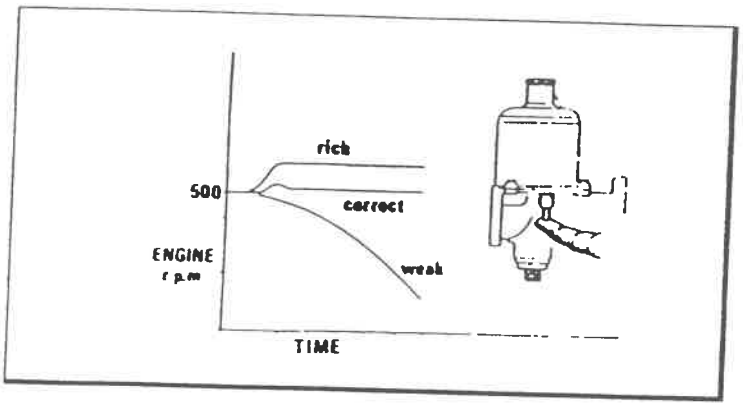
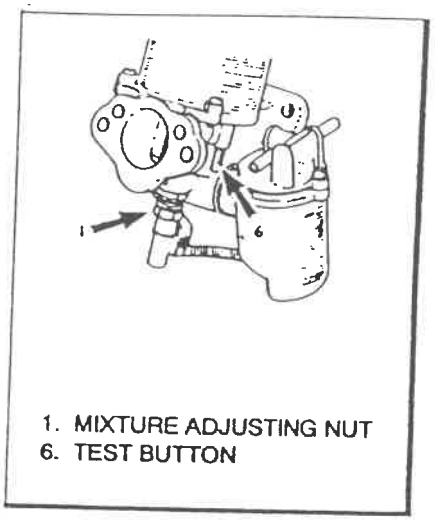




1. MIXTURE ADJUSTING NUT
6. TEST BUTTON

FAN BELT TOSS

OVER THE YEARS THERE HAVE BEEN A VARIETY OF FAN BELTS AVAILABLE FOR THE 4 CYLINDER TR'S . SOME WERE VERY GOOD , SOME WERE PATHETIC . HOW MAY OF YOU HAVE BEEN AROUND LONG ENOUGH TO REMEMBER THE GATES 507 , JOHN BULL , DAYTON GREEN STRIPE AND PROBABLY ANOTHER 20 OR SO BRANDS .

WELL HERE'S ANOTHER . CUMMINGS BELT **#178539 WRZ** . IT WAS ORGINALLY INTENDED FOR A CUMMINS DIESEL , BUT FITS THE TR , IS PRACTICALLY INDUSTRUCTABLE AND HAS ONE PARTICULAR CLAIM TO FAME - IT IS NARROW ENOUGH TO PASS BETWEEN THE RADIATOR AND THE CRANK "DOG" BOLT WITHOUT LOOSENING THE RADIATOR . THIS MAY NOT SOUND LIKE MUCH , BUT CONSIDER THIS :

YOU ARE ON A LONELY BACK ROAD AT NIGHT . IT IS RAINING . SUDDENLY YOUR AMP GAUGE GOES TO DISCHARGE , THE RED LIGHT COMES ON AND THE ENGINE BEGINS TO GET HOT . A HOOD-UP EXAMINATION REVEALS THAT THE FAN BELT IS GONE , BUT LIKE ALL GOOD BOY SCOUTS AND VERY SMART TR OWNERS , YOU ARE "PREPARED" ... YOU HAVE A NEW FAN BELT ! HOWEVER , AFTER A FEW MINUTES OF FUSSING IN THE RAIN , YOU MAKE THE INEVITABLE DISCOVERY THAT YOUR NEW FAN BELT IS TOO THICK TO FIT BETWEEN THE STARTER DOG BOLT AND THE RADIATOR ! LOOSENING THE UPPER RADIATOR SUPPORTS TO TILT THE RADIATOR FOWARD WILL SOMETIMES HELP , BUT NOT ENOUGH .

BACK NOW TO THE CUMMINS BELT , WHILE IT MAY NOT GO EASILY , IT <u>WILL</u> GO BETWEEN THESE TWO PARTS AND IS THE CORRECT LENGTH , SO YOU DON'T HAVE TO DROP THE FRONT GENERATOR MOUNT TO GET IT AROUND THE PULLEY . THIS BELT DOES HAVE A TENDENCY TO RIDE LOW IN THE PULEYS , PARTICULARLY WORN ONES , AND CAN BE A BIT NOISY WHEN COLD , BUT AT LEAST IT CAN BE CHANGED ON A COLD WET NIGHT !

KEN GILLANDERS - VOLUME 96 , APRIL 1991

DEVELOPMENT OF THE TR ENGINE

Part 1

It seems that we get a disproportionate amount of inquiries relative to the development, improvment and life expectancy of t Triumph engine. It seems that everybody has opinions, ideas and questions pertaining to this particular power plant.

Quite contrary to what most TR enthusiasts believe, the Tri TR series engine did not evolve from the Ferguson tractor engine rather the reverse is true. The Ferguson tractor engine evolved from the same source that the TR engine did. For all practical purposes, this particular engine was in production in 1948 with displacement of 2088cc with an 85mm bore and powered the Standar Vanguard as well as the Triumph 2000 Roadster and Renown. In al cases it had a simple branch manifold with a single Solex carbur and was rated at 68 horsepower at approximately 7-to-1 compressi It was however, the only suitable basis from which Standard-Triu could make a 2-litre sports car motor, and with this in mind, th original TR-1 had its cylinder bores sleeved down from 85mm to 8 which reduced the displacement from 2088cc to 1991cc in order to qualify for the 2-litre competition class. Further, on the TR-1 they added twin SU carburetors and the engine now developed 75 h horsepower at 4500 RPM with a 7.5-to-1 compression ratio.

However, after the Earls Court Motor Show of 1952 it was de cided that 90 brake horsepower would in fact be required to make car perform in a satisfactory manner, and Ken Richardson was hir from B.R.M. to do the development work on the TR-2. The first s was an increase in compression ratio to 8.5-to-1, followed by th increase of intake valve size by approximately 1/16". Third, a camshaft was ground which increased the lift from .360 to .375, the timing was modified by extending the inlet opening time to 1 from 10°, and the closing time to 55° from 50°. With some final on the carburetor needles and the distributor curve, ultimately horsepower was developed. It should now be recognized that this 90 horsepower represents an increase of approximately 30% over t original design limitations of this engine. Fortunately, howeve technology was improving at that time and a variety of refinemen were made to the engine prior to its release to the public, incl ing the substitution of connecting rod bearings of a much higher quality than the plain white metal ones previously used, and the replacement of the crankshaft with one of a cross-drilled config uration.

Unfortunately, technology can do just so much, and the basi limitations of this particular engine, its large, heavy 3-main b ing crankshaft which is somewhat flexible when combined with the very high reciprocating weight of its connecting rods do put a s ere limitation on the amount of horsepower that can be derived f it. Further, it should be pointed out that the 'bathtub' combus chambers used in this engine are not conducive to extremely good breathing, therefore there was a very definite cap on the amount RPM that could be extracted even reasonably safely from it.

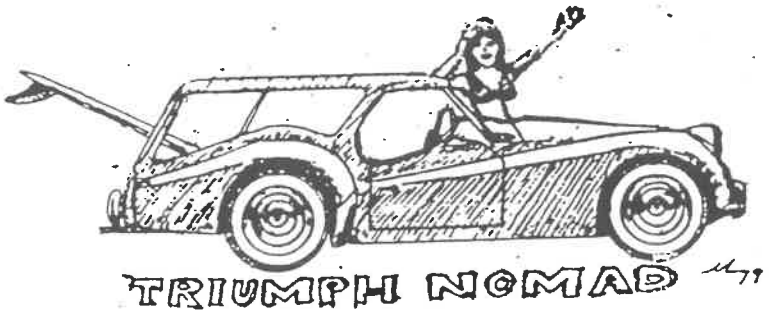
Therefore, it was considered until as recently as the early that the absolute safe top limit for this particular engine was a 115 horsepower, and that the crankshaft which appears to live for below 5000 RPM failed very abruptly once it was run for any lengt time above 6000 RPM.

Again more modern technology came to the rescue, and by virtue of shotpeening and nitriding, our crankshafts became much more durable, and with the advent of the 87mm piston and liner kit and the solid skirt pistons, we are arriving again at a unit that appears not to lose any of its durability yet continues to produce more power. Further, the improvments in technology relative to connecting rod bearing material, motor oils, and other durability advances resulting from balancing and clearance work within the engine continue to keep pace with the advances in engine power. Today it is not at all uncommon to see engines with 87mm kits, mild camshafts and headers that routinely produce 120 horsepower with dead certain reliability. However, most of these engines have had the additiona precautions of shotpeening the crankshaft, balancing the internal rotating parts and the use of a good quality oil to ensure their continued good performance. Yet, the old technological drawbacks of a crankshaft with high-frequency torsional oscillations, a 3-mai bearing layout and a very high reciprocating mass still remain the reason for the somewhat restricted ultimate horsepower potential in these engines.

Currently, most of our people are more interested in driving their cars and making small improvements in both durability and power output rather than reverting back to the days when this engin was being raced and everything was being pushed to the limit in order to keep the cars competitive.

In the upcoming issues we will discuss at length some of the advances in technology which have been utilized by the individuals and companies that build and rebuild these engines for both street and racing purposes in order to explain how these advances can benefit the average owner and perhaps increase his enjoyment of the car.

Ken Gillanders
Newsletter #26



ENGINE TECHNOLOGY - PART II

The Lower End

In the previous article a general discussion was presented relativ to the design evolution of the 4 cyl. TR engine. Further, as was indicated in that particular article we now plan on examining the advances in technology in depth and to take a long hard look at th application to both street driven and moderately modified engines.

The original TR crankshaft was quite similar to that used in the Vanguard and although by the time the car reached production as a TR-2 there had been a modification to the oil drillings in the crankshaft itself and a slight increase in the type of alloy that was used it was in fact basically a modified Vanguard crankshaft. Fortunately, by the time the TR-3 was introduced the crankshaft material had again undergone an additional improvement and the crankshaft at this point was fully cross drilled. It is therefore not recommended to use any crankshaft in a rebuilt TR engine that i not cross drilled as you will find that it is substantially less durable and in fact has approximately 50% of the life expectancy of later crankshaft. It is generally not considered suitable to use crankshaft that has been ground more then.020 undersize. Further, considering the high number of crankshaft failures we have had and that they all appear to fail by breaking on a line drawn through the fillet at the back of the number four connecting rod journal through the front end of the rear main journal it is recommended th crankshaft not be used unless it has been both magnifluxed and shot peened. Shotpeening particularly in the fillets at the rear part c the crankshaft has demonstrated that the life expectancy can be imp by approximately 200%. While balancing the internal rotating parts appears to do a great deal in cutting down the vibration in the eng it appears to have little or no effect on the tortional oscillation suffered by the cranksjaft in this particular engine but as a generality it is considered to be a highly desirable process when rebuilding one of these engines.

Fortunately the old plain white metal connecting rod bearings and main bearings are no longer available and the poorest quality availa bearing at the moment appears to be tri-metal bearings which are sol under a variety of makes. It is also quite fortunate that the moder multiple alloy bearings such as Clevite 77, Clacier Retinular and th

high quality Federal mogul bearings are still available for the Triu engine in a variety of undersizes. All of these engine bearings hav shown remarkable life expectancy and in fact the Clevite 77 has been demonstrated over a long period of time to be a superior unit in the engine. Fortunately, all of these bearings are compatible with any high quality multiple viscosity oil and in fact while we continue to have the Vandervel type bearings showing substantial pocketing with castrol multiple viscosity oils we do not have any recorded case of this particular type of failure with the Clevite 77 bearing. We are not quite sure why this should be the situation and we will continue to monitor engines as we take them apart to determine if in fact the is any correlation between the type of material used in the bearings and the type of motor oil run in the engine.

One further thought on the lower end of the Triumph engine. The engine blocks, as they come from Triumph, are painted with a very durable enamel that is utilized on both the outside of the engine block and on the inside of the crankcase area. The composition of this paint is apparently a secret only known to Standard Triumph however, it appears that after some years of experience the long hel practice of hot-tanking these engines is in fact counter productive. First, with the liners removed and the oil gallery plugs out virtual all portions of the engine block are excessible for cleaning. Secor the hot tank process which does such a fine job of cleaning the eng block also removes the paint that Standard Triumph utilizes on these engines. The principal benefit derived from having the internal surfaces of the crankcase painted is that it greatly assists the oil return to the oil pan and in fact appears to greatly reduce the winc or power lost through the oil that has been thrown off from the crar case during the operation of the vehicle coming back in contact with crankshaft and thereby creating both a reduction in engine power and reducing the period of time that the oil remains in the pan to be cc

Unfortunately, we have yet to find an after market paint that app be durable enough to be used on the inside of the TR engine and v several recorded cases where people have painted the inside of th engine after it was hot-tanked only to find that several thousand after the engine was put in service fragments of paint appeared in the oil and in fact in one case clogged the screen to the oil Therefore, the recommended procedure is to strip the engine of al its parts, plugs, sleeves, gaskets, wash it down in a good solver clean the water jackets with an appropriate wire brush.

One final caution on reassembling the lower end of a TR engine is that one should be absolutely certain that the camshaft bearings their respective bores line up as to oil holes and their respect retaining bolts. Next month we move to the top of the engine an discuss the factors that effect longevity there.

CRANKSHAFT FRONT HUB

We have noted that in the past few years, a number of our members' cars have crankshaft front hubs which appear to be loose on the end of the shaft. Generally, the problem is caused by excessive wear on the crankshaft woodruff key and on the hub itself which allows it to rock back and forth on the crankshaft.

Usually, the only suitable repair is to locate an unworn woodruff key and to check through what spares we have and attempt to find a new crankshaft hub assembly. Generally these crankshaft hub assemblies have been used for some time and in many cases a spare will turn out to have a worn-out keyway also.

However, we have recently been able to find five factory-new hubs (identified as part#8 in Plate B of the Roadster Factory TR-2/ Spare Parts Catalogue). This hub which attaches directly to the crankshaft has not been serviced by the factory for some 15 years. We were, by very fortunate circumstances, able to purchase five brand new ones, and we will hold them for club members who will have use for them.

Ken Gillanders
Newsletter #26

REAR MOTOR MOUNTS

Recently, I was pulling a transmission from a TR-3, and among the gathered "sidewalk superintendents" was a good friend who is quite an accomplished mechanic. While I was working, we were talking about this and that when he suddenly had a puzzled look. He then asked why I was removing the rear motor mount in order to pull the transmission. It quickly became apparent to me that some of the repair manuals did not advise pulling the rear mount, even though it makes the job much easier.

With the mount in the car, it is difficult to line up the trans with the engine when reinstalling it. Next time, after you unbolt the trans from the rear mount, raise the engine and trans as a unit about 1" at the rear mount, then remove the two 11/16" nuts under the frame pad and remove the mount complete. It will make the rest of the job easier.

Ken Gillanders
Newsletter #21

OUR CONTINUING GAS PROBLEMS

Beginning in 1975 with the EPA edic to reduce the tetraethyl lead content in automotive gasoline, we have had a continuous reduction of octane numbers in the available fuel. Now we fin that most refiners are discontinuing the manufacture of leaded premium fuels and changing over to unleaded premium fuels of 92 or lower octane.

As the fuel keeps getting lower in octane, we of the Triumph TR fraternity with our stone-age engines are getting into a dan gerous situation. If we use unleaded premium on a continuous basis, the exhaust valves will soon expire from a problem calle seat wear or guttering, caused by the lack of tetraethyl lead which acts as a lubricant on the valve seats.

In addition, the lower octane of the fuel is generally not satisfactory to prevent deonation in the bathtub combustion chambers of these engines, and ultimately, much piston damage can occur.

Fortunately, the problem is still under control at the moment as some refiners still have leaded premium available (specifically most indepent stations and Union 76), although we don't kn for how long.

Another potential solution is the interesting by-product of mix ing½ leaded regular and ½ unleaded premium. The resulting mix has a higher octane than either of the two components. The pet roleum engineers tell us that this is possible because the oc tane enhancers used in each fuel are chemically different and mutually supportive. The resulting blend has an octane number of approximately 93 to 94.

Yet another solution is the previously mentioned possibility of water injection, which can raise the octane number of the f being used by 2 or even 3 additional numbers. However, water jection does nothing for the problem of valve seat wear when r ning unleaded fuel. In addition, the water injection is still the experimental stage, but it does look very promising. An effect of water injection is that its use removes most carbo posits from the combustion chambers, reliving the "running on problem inherent in most SU-carbureted TR engines.

We recognize that gasoline is not going to get better, but at least there are some solutions and potential solutions avai

Ken Gillanders
Newsletter #15

CRANKSHAFT RESTORATION

As some our cars are now approaching twenty-five years of age and as the last of the new crankshafts, suitable for this engine, were made twelve years ago. It is evident that the supply of suitable spares is, at least, limited.

With used crankshafts still available from junk cars and wrecking yard engines that can be reground into a satisfactory spare parts, becoming scarce, it becomes important to examine all additional solutions.

Because of the design of the engine and the physical properties of the crankshaft and bearings, a crankshaft becomes progressively more unreliable as you grind the journals undersize. A crankshaft that is ground .020" under, on the connecting rod throws and .030 under, on the main bearing journals, has only half the life expectancy of a standard unground crankshaft and the life expectancy of a crankshaft with throws ground .030" under, is a matter of a few thousand miles.

At this point the only recourse use to be, to throw the old crankshaft in the trash and see if you could round up another one. Fortunately, we now have another and vastly superior alternative, hardchroming the journals back to standard. The final product on a sound core is superior in every way to a new crankshaft and at a lower price.

The technique I have found best, is to take the crankshaft to Carl's Automotive, 135 W. Walnut, Monrovia, Ca., phone 213 359 9057. It is best to start out with a shaft that is at least .020" under, on the throws and .020" under, on the mains, in this way the chrome will be thick enough to allow one regrind. First, the shaft is magna fluxed, to be sure it has no cracks. Second, it is hard chrome plated on the journals to about .040 oversize and the journals are then ground back to standard and micro polished. At this point you have a superior shaft that is usable without any further work and at this point you should balance the crankshaft, if you are going to. However, it is possible to put the crankshaft through one additional step, which will increase it's resistance to fatigue by 300%.

The Tri-Process Co., of 14922 Verdura, Paramount, Ca., phone 213 774 5310, is set up to shot peen crankshafts. This is a process where cast iron shot is driven against the steel crankshaft and peens a tough outer skin on the shaft which greatly increases the shafts resistance to torsional fatigue.

A crankshaft that has been hard chromed, balanced and shot peened, is a crankshaft that is superior to a new crankshaft in every way.

PISTONS AND RINGS

In the past year we have had a rash of broken pistons in engines which had been recently rebuilt. The pistons were all the 4-ring "AE" type from England and ranged from .040+ 83mm to standard 86mm. Unfortunately, in all cases the pistons broke without any warning and for no apparent reason. In all cases, the rings were still intact, and in one case they were the only things holding the piston together. With the others, the ring lands simply broke away from the piston and continued up and down in the cylinder bore, being held in place by the rings. In all engines, only one piston failed, and after replacing the offending piece, no further trouble was experienced.

Our recommendations are as follows:
1. Stay away from these "AE" pistons with the 4 rings.
3. Use the 3-ring type of piston...Hepolite, Mahle, Repco, and even factory pistons. There are several other good makes, but with the English pistons, they are sometimes sold under other brand names and it pays to be careful.

I have heard from some of the better foreign car shops and have recently experienced a great deal of trouble with the aftermarket "Apex" and "Covmo" rings as supplied by most of our foreign car parts houses. They are steel drain oil rings with cast top and second rings. The principal problem appears to be oil control. In all cases, when they are pulled out and replaced with rings by Grant, Deves, Hastings or even the original Hepolite cast rings, the oil burning problems disappear. As there is no reported difficulty with compression control or blow-by, we can only assume that the problem is with the 3 or 4-piece steel drain oil ring. This is one of those things to avoid as it is both expensive and annoying to repair. Everyone seems to have good luck with the other ring makes listed above (all but Grant and Hepolite have steel drain oil rings, but of a different design).

We will continue to keep you posted on potential problems that we discover, and would especially like to hear from anyone who has recently torn down their engine and found main bearings with their surfaces cratered or missing portions. Any other suggestions for topics to cover in this column are always welcomed.

Ken Gillanders
Newsletter #25

PART I

CARBURETORS

The roadster series of TR-2/3/3A/3B were blessed or cursed with two series of SU instruments that were different only in bore size and bolt pattern. They both share the same problems, design deficiencies, and operating difficulties. (Ja-heez!...is this guy an optimist, or what?? -ed.)

The most common difficulty seems to be a reluctance to return to a reasonable idle after normal driving. This problem is usually traced to badly worn throttle shafts and/or throttle bodies. There seems to be several different combinations of shafts and throttle bodies in use, but the majority appears to be one of the following two: either the brass throttle shaft runs directly against the cast alloy body, or the shaft runs against a bronze bushing that is pressed into the body. However, in both cases, most of the wear appears to be on the shaft itself, thus, a satisfactory repair can usually be accomplished by replacing only this shaft. We are currently attempting to find a long-range solution to this problem, but for the time being, replacement of the shaft, and an occasional drop of oil on it where it enters the body will usually do. Replacement shafts are available at BAP/GEON, or any other supplier of SU parts. (the correct shafts are currently in stock at MG/TRIUMPH ONLY - 12725 San Fernando Rd., Sylmar, CA (213) 362-5535 - ed.)

The other problem is both more prevalent and more difficult to repair. The moveable jet is held in place and sealed by an upper and lower packing gland washer. These glands allow the jet to move up and down for choke or mixture adjustment, while preventing fuel from leaking into the carb throat where it would unduly affect the mixture, or from leaking out the lower gland into the engine compartment.

Unfortunately, for years mechanics have routinely re-stretched the spring between the upper and lower glands to make their carb rebuilds more fuel-tight, and by doing so have inadvertently created a situation where the return spring on the choke linkage was not strong enough to overcome the additional drag caused by the too-compressed glands, and the jet refused to return to its seat, resulting in an overly rich mixture.

The cure is simple. 1.) Replace the spring at time of rebuild to get the proper tension. 2.) Always replace the moveable jet during a rebuild. There is a simple code on these jets that will prevent the use od the wrong size jet. On the TR series cars, only moveable jets of .090 and .100 were used, and either a "1" or a "9" was stamped on the flange where the throttle linkage hooked up, and if you examine the old one to find the code number and replace it with a jet bearing the same number, there will be no problem.

Next month: What oil to use in the dashpots, and why; also, various SU leaks and their cure.

CARE & FEEDING OF SU CARBS

PART 2

As promised last time, we should now tackle the problem of oil in the carburetor dash pots. Basically, the oil contained in the hollow shaft of the carb piston is intended to act with the parts attached to the damper cover as a sort of primitive shock absorber. However, it should only provide resistance in the upward direction, and should fall back freely to its seat when released. The purpose of this rather novel design is to reduce the air pressure over the main jet and thus enrich the mixture during acceleration. The piston's degree of resistance to movement is usually a function of the viscosity of the oil in the dashpot. Obviously, the thicker the oil, the more resistance, and the richer the mixture during acceleration.

All-out race cars use either very light oil (3-in-1) or none at all, but they aren't interested in slow speed operation and will usually run very rich needles (AV or SS). For street use in S. Calif., any 20wt., 30wt., or multi-viscosity oil works fine.

When adding oil, be careful not to overfill the chamber. If you look in through the top, you will see that the chamber is a hollow shaft inside the dome. With your finger, move the piston up and down until you can see which piece is the hollow piston shaft. You should use just enough oil to fill the shaft cavity when the damper head is placed back inside.

I am beginning to believe the old tale that goes, "if an SU carb does not leak, there is something wrong with it!". However, there are really only two places where a leak might be likely:
1. - the neoprene washers at the bottom of the float chamber where it attaches to the carb body.
2. - the packing glands on the main jet.
The first can be corrected with the carbs in place on the car by replacing the 2 washers on each float chamber, but the second will have to be done with the carb disassembled, and is usually done as part of an overhaul.

Parts and rebuild kits for SU carbs are made by a large number of manufacturers, and the quality ranges from excellent to junk. The prices for these also vary wildly, but beware - a high price does not seem to be any guarantee of high quality. A good foreign car shop can usually tell you what is good and what isn't.

Ken Gillanders

ADJUSTING TR CARBURETORS

The TRSC is composed of TR 2&3, which fortunately all used SU carbrators as original equipment. We are going to deal with the adjustment and fine tuning of these instruments.

The SU is a simple and reliable unit that gives good performance and reasonably trouble free service. However, its adjustments are critical.

To adjust the carburators for synchronisation, it is best to use a vacuum device like a Unisyn. A reasonable substitutecan be made by using a length of rubber hose with about a $\frac{1}{4}$" inside diameter. By placing one end of the hose of the edge of the carburator inlet and listening to the hiss of the incoming air, it is possible to adjust the throttle plates until both carburators are taking in the same amount. The hiss will then sound the same at both carburators.

Now is the actual adjustment procedure. First, lift each piston with your finger about $\frac{1}{2}$ inch and let fall. They should fall freely and smoothly without sticking or any sign of jerkiness. Each piston should strike the jet bridge with a solid metallic click. If they do not and try to hang open, the jet probably needs centering. (Best call me for instructions on this one should you find it) Next, disconnect the throttle linkage btween the carburators by loosening the small nut on the folded metal clamp. There is one of these on each end of the throttle rod next to each carburator. Listen for the hiss in each carburator throat with the rubber hose and adjust idle speed adjusting screws until they sound equally loud. Then tighten the folded metal clamp. At this point you should adjust engine speed by adjusting each carburator idle speed adjusting screw either up or down until the correct idle speed is attained. Then check the hiss at each carburator again to see that they are still equal.

It is now time to adjust the idle mixture. With a small screwdriver or pen knife blade, lift one of the carburator pistons about 1/16" and hold it.

1.) If speed increases, mixture is too rich.
2.) If engine stumbles and tries to die, it is too lean.
3.) If it continues at same speed a few seconds and then stumbles a little, it is mixture correct.

The mixture adjustment is accomplished with the large nut below the spring at the bottom of the carburator.

Turn ⟶ to lean
Turn ⟵ to richen

After both carburators are adjusted to the correct mixture, readjust the idle speed and recheck the carburator balance with the hose.

Additionally, each carburator has a spring wrapped around the throttle shaft that is adjustable and helps to positively close the throttle. To adjust, loosen the folded metal clamp and note which way the spring is moved in order to preload the spring. Move the folded metal clamp to arrive at the correct preload and tighten the clamp. You can usually tell when you need more preload on the carburator springs, as the idle spped will not want to drop back to the correct amount and will drift back slowly.

Another function of carurator tuning is the oil used in the dash pot. Usually the heavier the oil, the more resistance on the upward lift of the piston and the richer the mixture will be while accelerating. Generally the reverse is true. Do not use oil thicker than 30Wt or thinner than ATF(automatic transmission fluid). Do not fill the oil resevoir above a line approximately $\frac{1}{4}$" below the start of the cover threads.

There are a myriad of other ills that can befall SU carburators, but I won't get into them here. If you have any trouble call me.

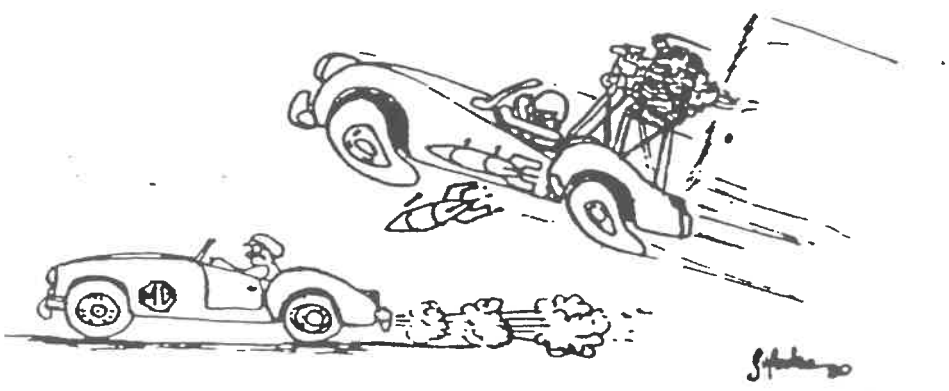
Ken Gillanders

THROTTLE LINKAGE CARE

It never ceases to amaze me how our beloved TR's survive sometimes careless maintenance and sometimes non existant maintenance. The worst example of this usually is the throttle linkage. How many of us have seen pivot balls in the linkage worn so far out of shape that the linkage jumps apart with the slightest nudge? How many of us have a bellcrank or bellcrank pivot that is not worn almost beyond recognition?

Most of this is unnecessary if at each service (about 2,000 mi. we will take an oil can and put a few drops of oil at each moving joint. While you are at it, check to see if the throttle return spring from the fire wall to the throttle arm is in place (you would be amazed at how many are missing.) It also won't hurt to have someone push on the throttle and then lift one piston and see if the carburetor throttle plate is fully open. All very elementry but a little care can prevent a lot of grief later.

Ken Gillanders
Unpublished as of this printing



ENGINE UPDATING AND TUNING - Part I

This article and the ones that follow are directed to the pro cedure and practicality of updating and tuning the TR engine.

The most practical place to start is with compression and the desireability of changing it. The average TR with SU carburetors requires premium fuel even with the standard 8.5 to 1 compression ratio. This comes about by virtue of a number of characteristics, some that we can change and some we cannot. We have seen a TR engine running on 94 octane fuel with SU carburetors and 9.5 to 1 compression that would "ping" so badly that you thought it would self-destruct, and have changed the same engine to Weber carbs and raised the compression to 10.5 to 1 and had the pinging disappear. Clearly the fuel vaporization and distribution has a distinct effect on the highest useable compression ratio.

Assuming that you have already changed the bore from 83 to 87 mm. as most performance-minded owners do, there are still several modifications you can do.

There is available (I have a few) a shim steel head gasket that crushes to about .028 inches, rather than the .055 in. or so of the stock copper asbestos head gasket. While the .030 or so does not sound like a large gain, it must be realized that this is off the entire area of the bore and not just the 50% represented by the open portion of the combustion chamber. Additionally, it should be realized that nothing has been changed permanently and it can be removed if found not to be advantageous.

However, for most of our speed nuts this is not enough, and they wish to pursue every last horsepower (of course I am excluded). The practical limit with 94 octane fuel and SU carburetors appears to be a mill of .060 off the gasket surface of the head and a shim steel gasket. However, if you have a very early head which has no angled flat cast in the bottom of the water outlet at the front of it, you will have to check for interference with the top of the water pump. In addition, you may have interference between the lower edge of the manifolds and the top of the block. Check before you bolt it up. Another good practice is to sand or grind the sharp edge left after the milling operation on the edge of the combustion chamber.

The increase in power and torque is very noticeable and is well worth the effort. If this arrangement proves to be too much, and pinging develops, you can always remove the shim steel gasket and use a stock one.

Ken Gillanders
Newsletter #9

ENGINE UPDATING AND TUNING - Part II

Carburetion and Exhaust

This is the second in a series of articles about updating and tuning the Triumph TR engine. For this second installment we will look into carburetion and exhaust systems and see what there is in loose horsepower lying around waiting to be collected.

For the average TR motor in either 1991cc or 2187cc trim, the stock 1 3/4" SU carbs and manifolds are very good, and most people who spring for the $350+ necessary to buy a Weber carb set-up are disappointed by the small power increase. For the money, the best investment is a TR-4A exhaust manifold, intake manifold, and short 1 3/4" SU combination (using SM needles). While the driveability is not as good as with Webers, the horsepower output is very close. However, the Weber carbs apparently are very superior in mixture control, reducing both the tendency for the engine to ping and to run on.

It is in the exhaust system that the most beneficial gains are made. One of the peculiarities of a 4-cylinder in-line engine with a common exhaust manifold is the problem of blowdown, where adjoining cylinders tend to block the exhaust flow from the cylinder in front of them in the firing order. Fortunately, if you can make the primary pipes long enough, you can reduce this problem of blowdown and receive substantially improved power outputs. A well-tuned 2187cc TR engine can gain up to 15 horsepower with a properly designed header and exhaust system. One point often overlooked is that the headers are only as good as what is downstream from them, and that is why most tuners recommend replacement of the standard 1 3/4" head pipe, muffler, and tail pipe with a 2" set.

We have, over the years, conducted a number of experiments with larger valves(both intake and exhaust) and found that for engines up to 2187cc, there is very little to be gained from larger valves. If, however, you decide to change them, I can provide the part numbers for them on request. I will cover putting the late TR-4A exhaust valves in the TR-3 head, and porting, polishing, and chamber work in the next article.

Ken Gillanders
Newsletter #10

ENGINE UPDATING AND TUNING - Part III

Cylinder Head Work

This is the third in a series of articles about updating and tuning the TR engine. I will try to handle the cylinder head, valves, springs, and pushrods in this article.

There are for our puposes four TR cylinder heads to be concerned with:

1. TR-2 & TR-3 Low Port (best forgotten except for authenticit
2. Early TR-3 High Port (without "flat" cast in water outlet)
3. TR-3A & early TR-4 High Port (with the flat cast in the out
4. TR-4A (small ports and chamfer in the chamber opposite the spark plug)

For the purposes of this article, the TR-2 & TR-3 Low Port is a special case and won't be tackled here. Therefore, we will start with the early TR-3 High Port. The principal weakness in this head is the large stems of the exhaust valaves. Fortunately it is possible, with valve guide #50818 from BAP/GEON (other suppliers use different numbers), to convert this head to take the TR-4A exhaust valve with a 5/16" stem resulting in much better gas flow. This change also applies to the later TR-3A and TR-4 head, with the same results.

One of the principal deficiencies of the TR cylinder head (all models), is their unfortunate valve spring and retainer assembly which is both too heavy and not of a modern progresssive wound design. In usual street trim, the most noticeable problem the tendency of the intake valve seats to pound out, as well as experiencing valve float long before the redline. We have an arrangement with Sig Erson (high-performance products) to provide us with an aftermarket valve spring kit for about $50.00 that includes aluminum valve spring retainers and dual valve springs c a much improved design. If you need a set, contact me and we wil get them in the next order.

Which brings us to the pushrods. Unfortunately, TR engines were supplied with pushrods in both 5/16" and 3/8" diameter sizes (seemingly at random!). The 5/16" pushrods are marginal for any application and impossibly poor for use with an improved valve spring set. The bad news is that the stronger 3/8" types are ver expensive to buy new (nearly $25.00 each right now...multiply tha by 8 for a full set! -ed.), but occasionally you will run across set in a spare engine. At least we have a low-cost alternative i that Erson will supply a thick wall chrome-moly 5/16" pushrod whi is at least twice as strong as the original for about $60.00 per set. The unfortunate part of pushrod trouble is that you never know when one of them will bend or break. (...do you, Martin?)

Porting and polishing the head are best left to experts, bu perhaps we can cover them in a later chapter. Next time we will discuss camshafts, lifters, and the importance of accurate cam timing.

Ken Gillanders
Newsletter #11

ENGINE UPDATING AND TUNING - Part IV

Flywheels, clutches, & transmission applications

This is the fourth in a series of articles on the tuning and improvement of the TR series 4 cylinder. This segment was originally going to cover camshafts, lifters, and cam timing, but it was decided to hold that one until some special illustrations showing the mysterious cam timing procedure could be prepared, so I'll move on to the next chapter and return to the cam business next issue.

There are two groups of starter & flywheel combinations in general use on the TRs, and you must use either one in its entirety...you cannot mix and match. (for a complete description of the starter and flywheel differences, see Martin's accompanying article)

The early series combined the long starter with the flywheel which incorporated the shrunk-on starter ring gear. It had the advantage of less rotating weight, and the ability of the flywheel to be lightened a great deal further. However, the starter drive bushing was prone to failure, and the use of the long starter precluded the use of the mass-produced exhaust headers, as they were designed for the TR-4 and there is not enough room for the long starter and the headers.

The later combination had the short starter and a flywheel with a bolt-on ring gear. This, however, prevented reducing the flywheel weight very much, so you are left with rather more rotating weight than you want. You pays your money & takes your choice.

Clutches, unfortunately, leave you with very little choice. The TR-4A/TR-250/TR-6 flywheel and diaphragm clutch assembly is available, but does not seem to work all that well, slipping under hard useage. Several of the clutch rebuilders can provide beefed-up pressure plates and high-performance lining for your clutch disc. For about $100.00 there is a special Ferrari unit that will interchange, and while being for all intents and purposes bulletproof, that is a lot of money. Perhaps it would be best to call me and we can discuss the alternatives.

Fortunately, a TR-4 trans will go into a TR-3 with very little modification. First it is necessary to enlongate the mounting holes for the rear motor mount to crossmember toward the rear about 3/4" with a rat-tail file. Then you'll have to pound a bulge in the trans cover where it contacts the trans by the starter extension on the right side to get clearance. TR-3B, TR-4, 4A, 250, and early TR-6 gear boxes all go right in. Lots of luck!

Ken Gillanders
Newsletter #12

FINALLY...HERE IT IS!

CAMSHAFTS, LIFTERS, and CAM TIMING PART V

This is the fifth in a series about updating and tuning the TR engine, and we'll try to cover the areas mentioned above.

There have been literally hundreds of re-ground performance camshafts for the TR 4-cylinder engine and I have tried over 60 of them myself. Frankly, outside of a racing-only purpose, I can find no practical use for a performance camshaft. The stock TR-3 type with its timing of 15°-55°-55°-15° is adequate for street use over the entire range up to the redline. The Isky re-grind #23 with its timing of 18°-58°-58°-18° should be better, but even an engine dyno couldn't tell the difference. Of the various after-market cams I have tried, I find the Isky 234 and the Erson 260T & TQ20 best. If you anticipate making this kind of change it would probably be best to call me direct and I will see if I can help.

The Factory recommendation for modification to the lifters is to use a lathe and shorten the lifter from the top by 3/8" and to bore out the inside diameter by .060. However, I have never found this necessary and I simply use the lifters as they come from the box.

Cam timing is unfortunately almost a black magic art form. Once a new engine has been run a few thousand miles, the timing chain wears in and the timing begins to retard. Now, the timing marks will only show how to line up the cam in a retarded position.

Without too much technical explanation, correct cam timing can be accomplished as follows:

1. With the #1 spark plug removed, insert a piston block into the hole (this piston block can be made by breaking the porcelain section out of an old spark plug and threading the inside to take a threaded rod of metal (a headless bolt works) about 4" in length). With the block in place the threaded rod extending into the cylinder should prevent the piston from coming all the way up to the top.
2. At this point, mount a degree wheel on the front of the crankshaft and mount a pointer on the front of the engine block. The uppermost holes for the timing cover bolts work well for mounting the pointer.
3. Now turn the crankshaft as far as it will go in a clockwise direction. When it stops, lock the degree wheel at 0°.
4. Now turn the crankshaft counter-clockwise until it stops, then read the degree wheel.
5. Divide the number of degrees by 2 from the zero to the new position, then move the wheel back to where it reads half of that total. This will accurately reflect top dead center at the zero mark.

6. Now, with the indicator at 0° and the #1 intake and exhaust valves both partially, evenly open (exhaust closing and intake opening), back off the valve adjusting screws on the rocker arms until there is no lift (so the push rod can be rotated by finger pressure)

7. Now turn the degree wheel and crankshaft a full 360°, then measure the clearance between the rocker arms and the valves with a feeler gauge (or stack of feeler gauges). If both clearances are within .005" of each other, the cam timing is as close as you can get it (1° equals .006"). If the exhaust clearance is wider than the intake, the cam is retarded. If the intake is wider than the exhaust, the cam is advanced.

The cam sprocket (camshaft chainwheel in official parlance) is bored with 4 eccentric holes and if it is rotated from one pair of holes to another, you can shift the timing either ½ tooth ahead or ½ tooth back. Further, the sprocket is drilled in such a manner that there is a ¼ tooth difference back to front, making adjustments down to 4° possible.

Now for several cautions:

Always turn the engine in a clockwise direction while checking timing.

If you have a choice, advance is better than retard (4° advance on a running engine trails to about 2° advance).

Back the valve adjusting screws in the rocker arms clear out of the way before beginning.

The first valve from the front is the #1 exhaust; the second is the intake.

If you have problems, give me a call.

Ken Gillanders
Newsletter #14

VALVE SPRINGS, RETAINERS, AND CAMSHAFTS

In a previous issue I discussed the use of more modern valve springs and lighter valve spring retainers on the TR engine. However, the Erson spring kit that I had recommended was discontinued about one year ago. Fortunately we now have a new source for this kit. There is a slight change in that the aluminum retainers have been superceded by titanium ones, for those who are racing and need the lightest possible part no matter what the cost, or a new lightweight steel retainer that is both lighter than stock and stronger than titanium or aluminum. Unfortunately, this spring kit now costs about $80.00 which reflects a price increase, but it is still the best spring and retainer kit on the market.

Erson has shown three camshaft profiles available for the TR engine: the 280T, 290T, and 300T. They are all regrinds on good cores, and absolutely need the Erson spring kit to be used. I have had personal experience with all three and find that while they are very good for racing, they are not too suitable for the street, with a lumpy idle and poor operation at very low RPM.

At one time Erson offered the 260T regrind on a good core and this cam was used by many Triumph people as it was very close to stock characteristics and, believe it or not, did all things better. It idled better, ran quieter, had better power and was easier on the valve train parts. However, it was dropped several years ago from their catalog but remained available as a special order. Erson tells me that this is still the case, and it takes about seven weeks to get one made up. The 260T's we have used have been outstanding in otherwise stock TR's and last the life of the engine.

It is fortunate to have a suitable replacement for the original pattern, which was a product of much earlier technology.

Ken Gillanders
Newsletter #28

PUSHRODS

This seems a good time to illustrate what can happen to the 5/16" pushrod. I was unlucky enough to have a set of thses in my engine but decided to re-use them during the engine re-build since they were in good shape ($). I knew the marriage between these and the Erson valve spring set (which I used) was a shaky one, but thought I could get away with it as I had no intention of flogging the car hard. Wrong! What you see below is the #4 intake valve pushrod which filed for dissolution while I was sitting at a red light with the engine idling. However, in this case it wasn't entirely the fault of the push-rod. I was having a problem with upper-end lubrication which I hadn't detected yet and this apparently caused a vlave to stick momentarily, destroying the pushrod. Fortunately, no other damage was done, and with curing the lubrication block and replacing the pushrods with a set of good used 3/8" jobs, the engine has run happily ever after.

Moral: If you are planning to build a high-performance engine and it has 5/16" pushrods, better ditch those things fast and use something burlier. My engine is basically stock and look what happened to me!

Marty Lodawer
Newsletter #11

PUSHRODS

If you like to run your TR at high revs (above 5000) you may have a built in disaster in your engine. Although there does not appear to be any rhyme or reason to it. TR engines are supplied with two different diameter push rods, either 5/16" or 3/8". I have found both sizes in the TR2-3-4-4A. It is the 5/16" push rods that are more prone to flex and break. I do not, however, recommend buying a set of 3/8" pushrods to replace a set of 5/16". If you happen to have an extra engine that has the larger push rods, use them, but to buy a new set from Triumph would be too expensive. Sig Erson has available a set of high strength chrome-moly push rods at a very moderate price. They are stronger than either of the stock sets and readily available.

Ken Gillanders
Newsletter #1

OIL LEAKS

As any TR owner is aware, Triumph engines have a tendency to leak pr seep oil around the valve cover gasket. Fortunately, we have found a sure cure for this problem. Valve cover gasket #VS 26038R as made by Fel-pro gasket company that can be ordered through any domestic parts house handling the Fel-pro gasket line. It is a neoprene, extra thick replacement gasket that does noy leak or seep if properly installed and can be reused several times at least. The one potential difficulty with this gasket is that it must be securely glues to the valve cover with contact cement, gaskacinch or 3M weather-stripping cement. But the gasket must not be glued on the side against the cylinder head.

Ken Gillanders
Newsletter #1

LUBRICATION

Sooner or later every gathering of Sports Car buffs gets around to the care and feeding of their darlings. We, as owners of TR 2 and TR 3, find ourselves in the unusual circumstance of owning cars with engines designed 50 years ago and with the available motor oils designed for the service requirements of much newer cars, operating under different conditions.

In the middle of this already confusing problem, the America Petroleum Industry saw fit to do away with their old classification system and develope a new rating system, based on different factors. The new rating system is broadly divided into the "S" (spark ignited) series; SA, SB, SC, SD, SE and the "C" (compresion ignited) series; CA, CB, CC and CD.

The "S" series starts out with:

SA (Raw mineral oil, no additives)
SB (Some antioxidant and antiwear capabilities)
SC (Designed to meet 1964-1967 warranties)
SD (To meet warranties of 1968-1971 control of deposits, rust and corrosion)
SE (To meet warranties of 1972-date control of sludge high temp oxidation)

The "C" Series

CA (Deisel grades with each higher letter designation giving more improved characteristics)
CB ""
CC ""
CD ""

Fortunatly no matter what the manufacturers say about or advertise their products as being, the proof of the pudding so to speak, is in the letters on the lid of the can.

Two examples are found in the 20-50 wt. valvoline oils. Both are from the same stock and have the same viscosity characteristics, however the additives are different and so is their A. P. I. classification as follows:

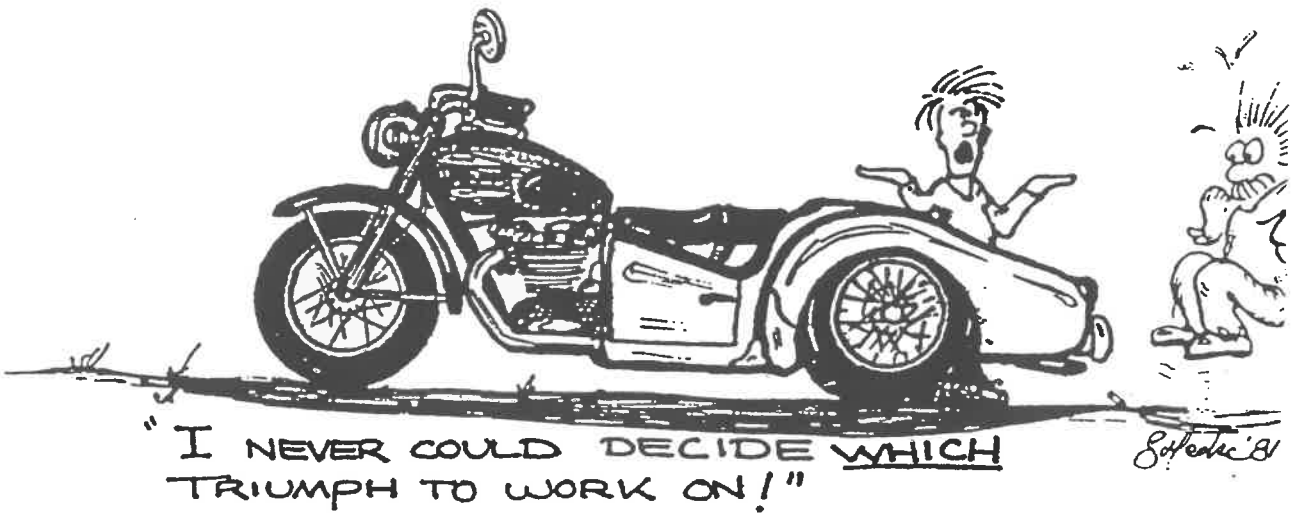
Valvoline 20-50 wt. racing SC, SD and SE
Valvoline 20-50 wt. all climate SC, SD, SE, CA, CD and CC.

In the case of the TR engine, we are confronted by entirely different circumstanses under which the motor oil must operate than in the more modern, domestic and smog equipment laden engines of today. The TR oil temperature under street usage seldom exceeds 160° and is usually operating below the dewpoint which will boil off some of the impurities. The standard piston clearance, ring design and crankcase ventilation system tend to polute the oil even more and promote the development of sludge and varnish deposits.

However, the new engines with oil temps in the range of 200° to 225° and with positive crankcase ventilation devices don't subject the oil to the dilution that the Triumph engine does.

When the operating conditions and mechanical characteristics of the TR2 and TR3 are considered, it becomes evident that good oil and relatively frequent changes become absolutely ne essary for decent engine life. The best recommendation I can give is a know brand of 20-50 wt. rated by A.P.I. at least SC SD, Se, CA, CB and CC. Among the companies producing such a product are Penzoil, Valvoline and Kendall. There are, I am sure, others that make a quality product of the same type.

Ken Gillanders
Newsletter #3



LUBRICATION - PART 1

Sooner or later, we always seem to solve problems that have plagued us for a long time without an apparent solution. So it was with the persistent "back lash" problems in the TR differential which usually show up as a loud CLUNK when the clutch is let out in either first or reverse gear with the car at rest.

Many TRs have this problem and at the first TR clinic this year we had a chance to pursue it on Bob Youngdahl's car since the rain kept most people away, leaving lots of time available. Bob's car had about 1/6 of a turn back lash, measured at the pinion flange, and while this is severe, it is not unusual. First, we took off the differential cover and were promptly suprised to find that the back lash (slop, or play) between the pinion and ring gear was the correct .008". The problem turned out to be caused by wear, not in the ring and pinion, but in every other metal to metal contact and the 1/6 turn was the cumulative effect of all those points of wear.

The cause? Although the unit was full of 60/90 gear oil, it looked to be as old as the car and very heavily oxidized. This appears to be consistent with the substantial wear problems we've been having with TR transmissions. This leads to the obvious suggestion that we will have to consider changing the lubricant more often and also consider using some of the special lubricants that are available.

The Lakewood Co. makes a special hypoid lubricant called B.F.L. which was developed for use in race cars. This might be considered overkill, but I am experimenting with one pint in the transmission and one pint in the rear axle and filling both units up from there with Valvoline 80/120. The results so far have been very promising and indicate that with proper lubrication, these units should last indefinitely.

Unfortunately, excessive wear in the transmission causes very expensive problems, and usually the harm is already done by the time you hear the noise. The transmission is very sensitive to the lubricant level and should be filled just up to the dipstick line in the earlier units and just even with the bottom of the fill hole on the late model transmissions, and kept free of contamination.

Ken Gillanders
Newsletter #15

LUBRICATION - PART 2

As was discussed in the last issue, just having the correct amount of lubricant in either the gearbox or the differential is not sufficient if it is contaminated, the wrong lubricant, or too old to be effective.

In the last two years, I have yet to overhaul a gearbox where I did not have to replace either the counter gear or the counter gear shaft, sometimes both. The difficulty is generally that the rear countershaft bearing has failed, or one of the bearing surfaces on the counter gear or counter gear shaft has broken through the case-hardening, effectively destroying the part. It appears that the problem is inherent in the design, and the failures come about when debris (metal particles, dirt, etc.) settle to the bottom of the casing and find their way between the rear countershaft bearing and the surfaces on which it works.

The only remedy that seems to work is to change the gear oil every so often and to use the best oil possible when replacing it. Again, the mixture of Lakewood B.F.L. and Valvoline 80/120 seems to work best, although any good quality gear oil will do.

Turning to the TR-4 and later gearbox, we have another prominent problem concerning the destruction of the thrust washer (or distance piece) between first gear and the first/second synchro hul Unfortunately, destruction of this washer seldom confines itself t that piece, and usually results in major repairs.

Our recommendation is to change the gear oil about every 5000 miles and to refill with oil of good quality.

Ken Gillanders
Newsletter #16

LUBRICATION

With the TR-3 models it becomes a little more difficult to lube the front wheel bearing, as it is necessary to remove the calipers in order to remove the rotor and get to the inner wheel bearing. The problem arises when the wheel bearings are not packed about every 8000 to 10,000 miles and the front brakes are used very hard. The resultant heat tends to bake the lubricant. However, we have found that Lubriplate 630-AA & 930- AA bearing greases appear to cure this annoying problem. The only precaution that must be taken is that all the old grease must be washed out of the bearings and hubs

Ken Gillanders
Newsletter #1

OIL PUMP ROTORS

As I wrote in last issue's article, replacement oil pump rotors made by Hobourn-Eaton are available from the Roadster Factory, and my pair have now arrived.

Putting them in is a straightforward affair, and is done by first removing the pan (nothing too complicated here) and then the oil pump itself (3 nuts and washers). By then undoing the four bolts which hold on the bottom housing of the pump, the bottom housing can then be removed and the rotors pulled out. Reassembly is accomplished by reversing the order, but be sure that the drive slot on the pump is aligned with the tang on the driving shaft.

What can you expect as an improvement? Well, in my engine I had 70 lbs. at 3000 RPM with the oil cold, dropping to about 40 lbs. as the oil got hot. At hot idle I had maybe 5-10 lbs. of pressure. With the new gears installed, I have 80 lbs. cold, and a running hot pressure of 70 lbs. Hot idle pressure did not go below 40 lbs. A great improvement to be sure.

There may be some bad news to go along with this, however, namely in the condition of my old rotor. When I removed them, I found that the outer rotor was broken in two, which obviously didn't do my oil pressure any good. In addition, the outer rotor would just barely turn in the housing and must have consumed an incredible amount of power just to turn it. How many other TR's with oil pressure problems are traceable to broken rotors I don't know, but this is the third one I have seen in the past year.

While doing all of this, I took the opportunity to change the engine oil from the 20/50 ARCO Graphite that I had been using to Valvoline "All-climate" 20/50. As I already had the pan removed, I inspected the middle main bearing and one of the rod bearings. Both of them showed virtually no wear or bearing checking. Further, there was no dirt, sludge, or deposits anywhere in the lower engine. Apparently, the ARCO Graphite performed very well indeed, but it is so difficult to come by in the 20/50 weight that I decided to change. It should be pointed out that I was always concerned about putting oil into an engine that was blacker than anything I had ever drained out, but its performance was outstanding.

Ken Gillanders
Newsletter #24

OIL PRESSURE

Whenever a group of TR people gather together to talk about their cars, sooner or later the subject gets around to oil pressure. How much is good? How little can you get away with? Why does it drop to 5 psi. when hot?

In order to get the answers, it is necessary to look at the whole system. First, any engine, and of course Triumph engines, have internal working clearances that allow some of the oil that is pumped under pressure to escape from the system. It comes out around the rod bearings, main bearings, camshaft bearings, and is lost through the valve gear. This is the way it is supposed to work, but the engine will bleed down a much larger volume of oil when that oil is hot and then than when it is cold and thick.

Inversely, the oil pump will pump more pressure (and up to a point, more volume) when the oil is cold than when hot. So, we end up in a situation where, as the oil heats up and thins out, the engine will demand a greater volume of oil, while the pump's ability to produce will diminish. When the demand exceeds suppl the pressure regulator of the side of the block closes, ceasing to regulate oil pressure. At this point, oil pressure is a func tion of engine demand and pump supply. At idle, the internal wear and clearance in the oil pump causes its efficiency to drop while engine demand remains high. The result is very low oil pressure.

To further complicate this whole mess, as the engine wears, its oil volume demand increases, and as the oil pump wears, its ability to supply decreases, and we end up with running pressures less than we would like.

An idling engine without load will survive on about 5 pounds of pressure, and a car running down the freeway at about 3000 RPM can survive on about 40 psi. oil pressure, but now, thanks to the Roadster Factory, we can do something that will help. They will now be able to supply new oil pump rotors (part number 504862 @ $39.50 each). These rotors are made by Hilborn-Eaton, the original makers of the pumps, and they will certainly help our oil pressure problems tremendously. In addition, the use of multi-viscosity oils (preferably the 20-50 weight variety) will help the situation.

So don't panic, rebuild that tired oil pump with a new rotor, use 20-50 oil, and try not to worry too much.

Ken Gillanders
Newsletter #23

OBSERVATIONS OF AN ITINERANT MECHANIC

SOME POINTS WORTH CHECKING ON YOUR SU's

1 - check that the damper assembly suits the suction chamber: if the web on top of the suction chamber has an internal drilling then the screw in damper cap must not have an air bleed hole. The damper cap should have a hole only if the suction chamber web does not.

An SU with an air bleed hole in the suction chamber web AND the damper cap will cause the engine to run rich.

2 - Check that the oil used for the dampers is suitable; if the oil is too light a 'flat spot' will be evident when accelerating due to momentary weakening of the fuel/air mixture.

If the oil is too heavy a puff of black smoke will be evident on acceleration.

The carburettor pistons should rise together and at the same rate: their operation may be observed by removing the air cleaners and manually operating the throttle lever with the engine running.

A piston that rises too quickly requires a heavier oil in the dashpot; I have found engine oil to be generally the correct viscosity for SU dashpots with TR's (about SAE 30).

3 - Check that the correct metering needle is used; for general use and touring the 'SM' needle is used for the H6 (1 3/4in) SU's and the 'FV' needle for the H4 (1 1/2in) SU's. For the above conditions 'competition' needles are ineffectual, considerably increasing fuel consumption and carbon build on valves and in ports.

4 - Check the type of needle and seat used for the float bowl is th e correct type: the needle should be the lightweight plastic type with a spring loaded pin: a solid metal needle has a tendency to be affected more by engine vibration resulting in higher fuel level and flooding; the seat should have the 'large' hole of approx 0.090 inch.

5 - Check the fuel level in the float bowl by removing the suction chamber/piston assembly and seeing that the fuel visible in the jet hole is 1/8in - 1/4in below the top of the bridge piece; adjust the fuel level by carefully bending the forked lever in the float bowl

This method of checking fuel level in the float bowl is more reliable than the spacer rod method as SU float bowls may be at different heights relevant to the carburettor body depending on the means by which the bowl is attached.

The final result of any fuel level adjustment must be the correct level of fuel at the bridge piece.

After adjusting the forked lever and before checking the fuel level at the bridge piece ensure that enough fuel is removed from the float bowl to make it necessary to use the primer lever on the fuel pump to top up the bowl.

A Leaked Oil Story

A few weeks ago a friend rang and asked if I could have a look at his 3A as it was consuming exceptionally large quantities of engine oil; he had tried all the readily accessible remedies with marginal results and was now reconciled to the prospect of a possible major operation; all he wanted was an someone to tell him where to start.

I knew the car to be much loved and understood his concern; the car duly appeared on the concrete apron of my driveway as did a pool of fresh engine oil.

A quick under body inspection revealed an oil coated sump and chassis with indications that the worst leak was somewhere in the area of the lower front of the engine. The signs were that the seal between the engine and sump was faulty due to probable sump flange distortion and the only proper solution was to drop the sump, straighten the flange, and replace the gasket.

As the means to carry this out were readily at hand we set to and soon the sump was off and presented for inspection; a straightedge passed over the flange confirmed the diagnosis and so about 45 minutes later a clean, reasonably straight sump, and two freshly cut gaskets were 'offered up' to the engine and fastened in place. As the drained oil was fresh it was replaced and the car driven around the block to check the effectiveness of the operation; all was in order so it was time for tea and biscuits before a much relieved friend left for home and I mentally chalked up another solved problem that was thankfully much more simple than it might have been.

A week later my friend's car was back on my driveway and unfortunately the pool of oil was too; this time however, the leak was restricted to a point on the sump flange adjacent to the near side front sealing block joint.

I thought that the most likely reason was that the T shaped cork seal had become recessed and; not wishing to drop the sump again; I suggested that the solution would be to loosen the sump bolts enough to allow a little silicone sealer to be injected into the problem area; my friend left with the assurance that he would do this as soon as practicable.

A few days later my wife called me to the phone. it was my friend with the 3A wanting to pass on the news that the problem had been solved and indeed this appeared to be so.

It transpired that after commencing to loosen the sump bolts my friend decided to do the job properly so he drained the oil and dropped the sump; he then inspected the engine sump flange in the area of the leak and found that the cork seal was in fact a little depressed. He then wisely inspected the gasket surface impression in that area and noticed a significant depression in the gasket material that corresponded to the head of one of the fixing bolts for the sealing block; inspection of the bolt showed that it was standing proud of the mounting face enough to prevent the sump gasket from doing its job.

Removal of the bolt revealed that it had been fitted with a split washer and it was this that was causing the problem; the bolt was refitted without a washer and the sump and gasket reinstalled - problem solved!

Although it is a lesson I have learnt the hard way many years ago, it is a sobering thought to realise that I can still make the mistake of making an assumption and neglect to check the minor details; although a cursory inspection of the original gasket showed the sump flange to be distorted, a closer inspection would have shown the real reason for the oil leak. D.R.

THE BY PASS OIL FILTER SYSTEM

Early TR's were fitted with a 'by pass' system which only accepted oil flow from the by pass valve normally set to open at 70 p.s.i. there is no oil filtration at all below 70 p.s.i. and, unless the oil pump is in excellent condition there is not much above either. Oil (and anything that might happen to be in it) is pumped directly from sump to bearing surfaces; only oil flow generated by excess pressure finds its way to the filter and then back to the sump.

Consequently, as wear takes place and oil pressure capacity falls the filter becomes even less effective; even at its best a by pass system cannot prevent particles in the oil reaching the bearings. A by pass filter head is characterised by a single pressure relief valve with its adjuster and large lock nut.

THE FULL FLOW SYSTEM

The inefficient by pass system was superseded by the full flow system and fortunately the two filter heads are compatible, so a by pass head may be exchanged for a full flow head. The filter bowl and element are interchangeable but the long bolt is different.

In a full flow system ALL the oil pumped to the bearings has to first pass through the filter; the excess pressure flow returns directly to the sump; another pressure relief valve (non adjustable) ensures that oil flow to the bearing surfaces is maintained if the filter becomes clogged. The full flow filter head is identified by the large hexagonal head of the spring holder of the second pressure relief valve.

I strongly recommend that owners of TR's fitted with by pass filters change over to the full flow system when practicable; we do have a few of these filter heads at our shed - D.R.

Note

An observation has been made that the pressure reading at the gauge varies more often with a full flow system than with a by pass system - this is normal and is of no concern unless the variations are excessive. D.R.

Q: I recently overhauled the two-speed wiper motor on my Cat replacing the brushes and cleaning the commutator segments, de-greasing and cleaning the gearbox components etc. Yet on reassembly the motor is very stiff and noisy in operation.

The wiper spindles and wheelboxes are free and well-lubricated, so what could be the problem?

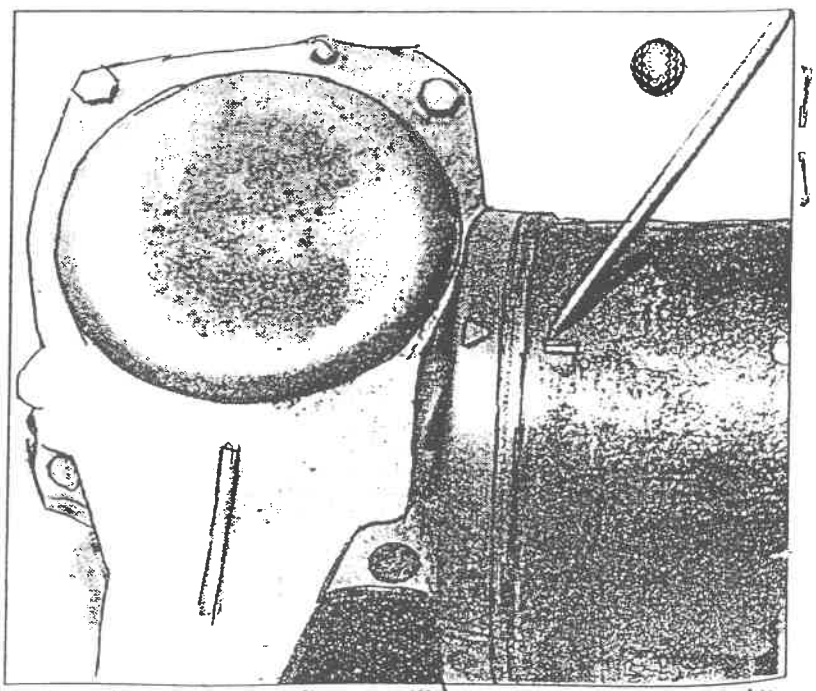
A: The Lucas Type 14W was the standard two-speed motor of the Sixties and Seventies, supplementing the single-speed type DR3, and both units and normally long-lived and reliable.

In this case, the most likely cause is incorrect endfloat on the armature shaft - the setting would have been lost if the thrust screw fitted at the side of the gearbox was disturbed during cleaning/overhaul.

Endfloat has to be set before the gearwheel/crankpin assembly is fitted; simply place a six thou feeler gauge between the end of the armature shaft and the thrust screw face and tighten until the gauge is just nipped between them.

Allowable endfloat is between four and eight thou.

Also, make sure you've replaced the yoke correctly to the gearbox. There are two marks – see picture, right – which should be aligned, although these can sometimes be indistinct if the casing has corroded.



A check of the two marks in alignment will ensure the yoke is correctly fitted to the wiper gearbox.

6. Having Your Engine Feel Secure

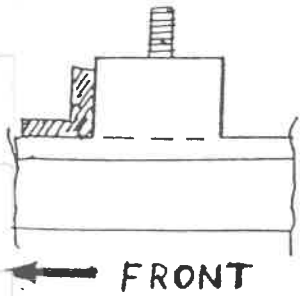
by Ken Gillanders

The four-cylinder Triumph does not rate among the smoothest of engines. While that in itself is not a handicap, it does lead to one. The original designers realized that the TR was a rough-running unit, and in order to make it smoother for the buyer, it was mounted on three rubber mounts that have one thing in common: they rely on the natural resistance of the rubber to keep the engine in its place. However, as the rubber in the mounts gets older, it gets softer, and less able to keep the engine in place.

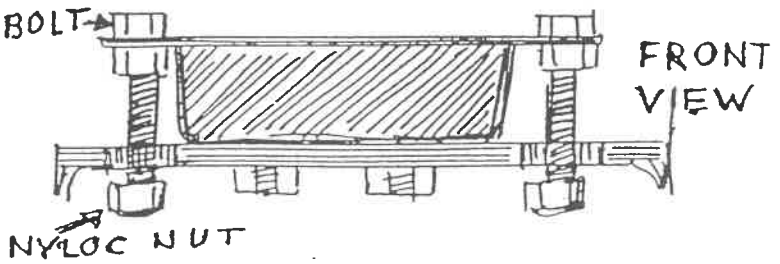
Obviously for severe applications it is necessary to bring this under control. I usually use a piece of steel "U" channel, 3/4" x 2", and cut off one of the 3/4" sides. Then I cut a piece about the same width as the front motor mount, drill a 11/32" hole in the middle of the remaining 3/4" leg and mount it forward of front motor mount by using the motor mount bolt through the drilled hole, having the long side of the channel run up the front of the mount to keep the engine from coming forward.

The best retainer for the rear (transmission) mount is to remove the 1/2" bolts securing the transmission to the mount and, with a long center punch, mark the crossmember directly below where the mount bolt fits. Repeat on the other side, and after removing the transmission, bore two 3/4" diameter holes in the cross piece.

It is then necessary to get two bolts, 1/2" NF about 3 1/2" long, run them through the transmission holes and the holes in the motor mount, then place a 1/2" nut and lock washer on each bolt and run it up to secure the mount to the transmission. At this point the remainder of the bolt should be sticking through the 3/4" hole in the crossmember, but not touching the sides. Then, coat the threads of an elastic nut (locknut) with Loctite and thread it up from the bottom until it is on the locking portion, but not touching crossmember. This will prevent the rear end of the transmission from moving in any direction beyond the limitations of the supports, and perhaps you can avoid that costly "fan into the radiator" experience. On the rear mount, remember to also put in the little 90 angle brackets to support the trans in case the rubber should fail.



MOTOR MOUNT



REAR MOUNT

CARBURETION

The merits and demerits of SU carbs have been batted around for years. Generally your first urge is to throw these sons of jackasses out in the back ally and get something else. —DON'T DO IT!— A bit of understanding and some do's and don't's can cause them to perform like the champions they really are. Only a couple of things ever really wear out and they are:

1. Throttle shafts and butterflies
2. Jets and Needles

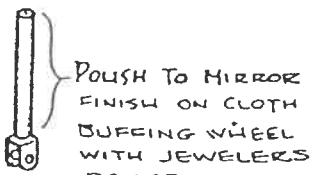
Wobbly throttle shafts must be replaced. Fortunately the bushings in the body seldom goes bad, except in a few radical cases. If the bushings are bad though, you must find that friendly machinist again and have the holes renewed to an inside diameter of .313-.315. New shafts should measure .3120-.3125. Since the chore of refitting the throttle levers requires a good drill press, get him to fit the shafts completely. Trying to drill these shafts with a hand drill usually ends up in some sort of utter disaster.

Refit the throttle butterflies. Be certain that they are centered in the body BEFORE tightening the two little screws. These break easily so don't get ham-handed with them. If the space around the perimeter of the butterfly shows an all around halo of light, new butterflies are a must.

JET and NEEDLES

If the needle shows a satin finish and the tapered surface near the base has any longitudinal scratches it is not servicable, nor is the jet. It has been improperly centered and this is the primary cause of needle wear.

Polish the surface of the jet on a cloth buffing wheel with jeweler's rouge to a near mirror finish. Then your new seals have a fighting chance for a long, leak-free life.



JET

fig. 3

Install the needle into the piston with the shoulder flush with the face of the piston. Soak all the cork gaskets and seals in clear water for at least ten minutes before installing them.

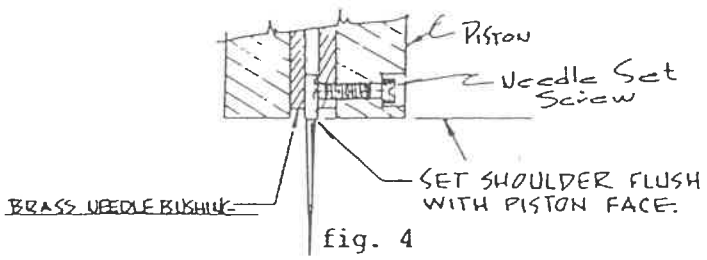


fig. 4

SETTING THE NEEDLE

STARTER SOLUTION

In England where the weather is often very cold and where starting becomes a problem, they have taken to installing TR-6 starters.

First the TR-6 ring gear is an exchange fit on a TR-3 flywheel and then while they have the engine block out they machine .125 in. off the face of the block where the starter mounts. This repositions the starter pinion to the correct depth in the flywheel ring gear. Next they run the primary battery cable from the battery positive terminal directly to the solonoid terminal on the starter itself and remove the original solonoid. This might not be the answer for everybody but the much stronger starter motor and much more favorable gear ratio will really spin the motor over.

Is It In Time?
or What Time Is It In?
or What The Hell Is Time Anyway?

Bruce Stutzman

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One of those sort of routine things that is done when a car is tuned is checking, and if necessary, adjusting the timing. But what are you actually doing, how do you do it, and how often do you have to do it?

Timing 101

First a few terms and definitions:

1. *Timing Chain* - all older cars including our TRs have timing chains. Newer cars have timing belts. They keep the camshaft(s) in time with the crankshaft. This is sometimes called valve timing. So, they have nothing to do with this article, which is about ignition timing.

2. *Top Dead Center (TDC)* - the point in the revolution of the crankshaft when the number one piston is at the top of its compression stroke. This is critical, in order to time your car when the engine is at TDC (see #9).

TDC means After Top Dead Center; BTDC therefore means . . . . *(Blast The Damn Car - the point in the revolution when the peasants storm the garage in frustration — Ed.)*

3. *Advance* - with engines at idle the spark occurs in the vicinity of TDC. As the RPM increases the spark must occur earlier if the engine is to run properly. Advancing the spark is a function of the distributor. As the spark advances it occurs earlier BTDC. All distributors have a built in maximum advance, usually around the area of 11 to 15 degrees. (Note the max. advance should not be confused with total advance. Total advance relates to racing engines and matters not to the street engine tuner.)

4. *Contact Breaker Points* - they are in the distributor and can be seen easily if you remove the distributor cap. We just call them points. I don't know why they're called points because they're actually 3/8" diameter circles. One point is stationary whilst the other is on a

between .014" and .016". You must make sure that this gap is correct before timing your ignition.

5. *Cam* - not the camshaft that operates the valves, but the distributor cam. This is a shaft in the center of the distributor, upon which the rotor arm sits. The Distributor cam is driven by gears via "that other camshaft" and, consequently, turns at half the speed of the camshaft. The distributor cam has four lobes in the case of a four cylinder engine and six in the case of a six cylinder engine. It is the turning of this cam that causes the points to open and close.

6. *Centrifugal Weights and Springs* - these are found in the body of the distributor underneath the base plate. They can't be easily seen without removing this plate along with the points and grounding line. As the RPM of the engine increases the weights move outward due to centrifugal force. These weights are connected through springs to the distributor cam. As the weights move outward they move the cam relative to the rest of the distributor, and advance the timing of the spark. The rate of advance and amount of advance are determined by these springs. This is called the advance curve.

7. *Distributor* - that mysterious device on the driver's side of the engine which contains the points (which you can see), the weights (which you can't see) and sometimes a vacuum advance unit. Ordinarily the distributor body must be turned slightly to adjust the timing. If you turn it clockwise you advance the timing, whilst turning it anti-clockwise will retard the timing. The cam and rotors on TR distributors turn counter clockwise.

The TR2 and TR3 use Lucas distributor model DM2, the TR4 and 4A use model 25D4 and the TR250 and TR6 use model 22D6. The TR6 however, use three different distributors, all different from the TR250 and yet all model 22D6.

8. *Micrometer Adjustment Nut* - this nifty little device is on models DM2 and 25D4, but not on the 22D6. You can alter the timing over a limited range by

markings to show which direction advances or retards the timing.

9. *Crankshaft Pulley* - the round device that is attached to the front of the crankshaft and, therefore, can be found on the lower front end of the engine by the rad. A TDC mark (in the case of the TR2 through TR4A) or TDC degree scale (in the case of the TR250 through TR6) can be found on this pulley. You use these timing marks to locate TDC and to time your engine. When you are standing in front of your car and looking at the engine the pulley, and thus the engine, should turn clockwise. This is the only direction in which you should turn the engine by hand.

10. *Static Timing* - setting the ignition timing when the engine is not running. The only instrument you need is a 12 volt test light. It can even be done without a test light but we'll talk about that another time. This is the only way in which you can time the ignition on the TR2 through TR4A as they lack a degree scale on the pulley. (Unless you make your own degree marks on the pulley.)

11. *Dynamic Timing* - setting the ignition timing when the engine is running. To do this you'll need a stroboscopic timing light. Some lights only operate at low RPM and can only be used to set the timing at idle (which is where the manuals tell you to do it). A high RPM timing light is needed to measure the timing advance at high RPMs. This is an obvious necessity for a racing engine or any other high performance car when setting "total advance".

Doing It

Now, back to the questions in the first paragraph:

1. *What are you actually doing when you adjust the ignition timing?* You are establishing at what time in the engine cycle the spark occurs. The engine manufacturer has determined the optimum time. It's in your manual. This changes as the RPM goes up, but the springs and weights in the distributor take care of that if they are

2. *How do you do it?* Read the manual. It tells you. *(Oh give me a break! I type this all in to come to that? — Ed.)*

3. *How often do you have to do it?* Not very often. If your engine starts easily it's in reasonably good time.

One last thing. When you statically timed your TR3 or dynamically timed your TR6 at idle you are assuming that the centrifugal weights and springs are working properly, and they probably are. It is possible, however, that these weights are not moving freely, because of dirt and corrosion. An easy way to find out is to grab the top of the cam between your thumb and forefinger and rotate it clockwise. It should turn about 1/8" and then spring back to its original position when you let go.

One more last thing. Most manuals chart distributor advance curves by showing the degrees of advance at different RPMs. It is important to remember that the distributor cam turns at half the speed of the crankshaft. Most manuals, however, chart it by the distributor and not the crankshaft (the TR6 manual charts both). Where the TR4 manual shows 9 to 11 degrees of advance at 1200 RPM that is actually 18 to 22 degrees advance at 2400 RPM on our tachs.

MISC. KNOCKS & NOISES

Adding to the list of annoying noises made by elderly TR's are those most common; engine noises. Here are a few things to check for.

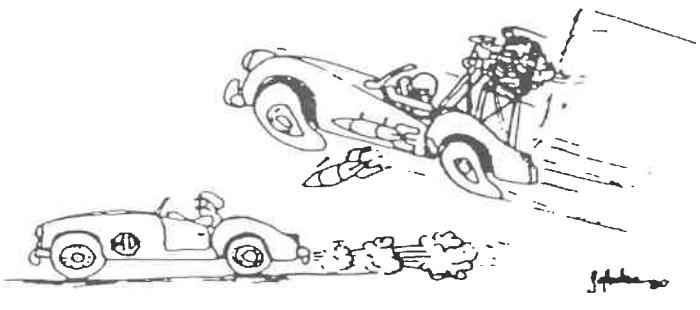
1) Fan hub rubber bushings. This annoying noise is most noticeable at idle, and usually subsides when under way. This clattering sound is usually diagnosed (incorrectly) as a bad timing chain tensioner or a very loose timing chain. You can diagnose it yourself by gripping the fan and trying to wiggle it, checking for looseness. If it's loose, you'll have to pull the front apron off to change 'em. This, of course, is the time to consider changing to a Hayden Flex-fan, a great improvement.

2) Timing chain tensioner. It may sound like a worn tensioner because that's in fact what it IS! Again, the apron will have to come off, then you can remove the lower pulley and then the timing cover to replace the tensioner (and the chain, if at all suspect).

3) Lower pulley and hub assembly. While you're at it, check that unit as you go to remount it on the crankshaft. The slot for the Woodruff key may be worn, allowing the hub to bang back and forth on the crankshaft. Loctite "Quick Metal" is the answer to that one.

4) Lower end wear. This is probably the most common engine noise...it's very easy to diagnose, but not easy (or cheap) to repair. It usually manifests itself as a dull knocking sound when the engine is first started up after sitting overnight, and disappears as the oil pressure comes up. This generally indicates worn rod bearings. Replacing the worn bearings will help, but it is often only a temporary solution, as the crankshaft will likely be out of round, and needing a re-grind.

Ken Gillanders



22.

Speedi Sleeves

by Ken Gillanders

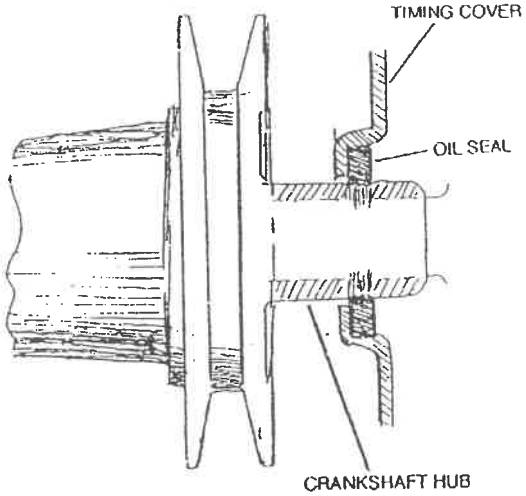
In our never ending search to make our 4-cylinder TR engines more oil tight we cannot overlook some of the problems associated with the timing cover oil seal and the surface of the crankshaft hub that it rides upon. For a time we had a small supply of new old stock hub pieces, however these were soon used up and we are now left to search for alternative methods of repair.

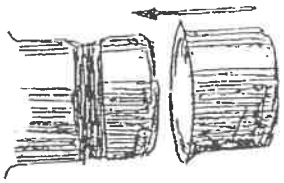
Perhaps this is a good place to explain what we were trying to repair and why. When a circular oil seal runs against a shaft for an extended length of time, a characteristic ring of wear appears on the shaft at the point of contact with the seal. The longer the shaft wears, the worse the ring gets until it becomes a groove deep enough to allow oil to escape the seal. The result is the usual oil leak mess we see so often from the front of a TR engine. Up to this point, all you could do was replace the seal with a new one, which would buy a little time but, without any new hubs to replace worn ones, the repair was very short term indeed. We sometimes tried repairing old hubs by disassembling them, brazing up the grooves and regrinding the exterior surfaces, but this was both expensive and very time-consuming.

Now we have an almost permanent repair. Thin metal sleeves are made by several manufacturers under their own trade names, such as Speedi-Sleeve, Redi-Sleeve, etc., and they are made to be installed over the damaged portion of the shaft to provide a new surface for the oil seal to ride on. They are made thin enough so that they do not cause any malfunction of the oil seal when installed.

The makers usually recommend that all burrs and high spots first be removed from the worn hub with a file or emery cloth. If the shaft is severely grooved it is suggested that the groove be filled with powdered metal type epoxy filler and the sleeve installed before the epoxy hardens. With the shaft properly cleaned and prepared, coat the inside of the sleeve with a non-hardening sealer such as Permatex #3 or Gaskacinch. Then locate the worn area on the shaft that the sleeve will have to cover - it is essential that this worn portion be covered! The sleeve is placed over the shaft with the flanged side going on first. At this point, place the installation tool (supplied with the sleeve) over the sleeve and gently tap it down over the shaft until it covers the worn area and the flanged end is seated at the base of the hub shaft. In rare cases it may be necessary to break off the excess flange with a pair of pliers.

These repair sleeves are available from most of the major Triumph parts suppliers (including BFE with a price of $26.45) and make a very long lasting repair that will do wonders to clean up that messy leak at the front that blows oil all over everything as we drive along.





SPEEDI-SLEEVE PRESSES OVER WORN HUB TO PRESENT A NEW SMOOTH SURFACE FOR OIL SEAL TO RIDE ON.

and rotating it 90deg. to employ the alternate pair of flats on the sleeve flanges.

It is recommended that a completely even and light coating of jointing compound or gasket cement be applied to the flanged faces of each pair of cylinder sleeves and to the mating faces of the cylinder block. Of course, it is essential to see that all the components are scrupulously cleaned of all loose deposits and to see that the machined faces on which the sleeve flanges rest are clean and free from burrs.

It isn't necessary to remove the engine to inspect or replace the big-end bearings. Drain the sump oil when it is warm, and jack up the car. Remove the sump bolts and lower the sump at the front, manoeuvring it past the gauze filter on the oil pump. Once the sump is off, it will be seen that the big-end caps are placed at an angle to the centre line or axis of the rod, and dowels are used to locate the caps. Apart from other factors, this method of fitting allows the big-ends to pass through the bores of the wet-sleeve liners.

Valve Timing

To carry out normal tappet adjustments, the engine should be cold and, after the rocker cover has been removed, the engine turned by hand until the valves of one cylinder are rocking. Continue turning for exactly one complete revolution—this will place the rocking valves on the heel instead of the nose of the cam. Loosen the lock nut, press down on a screwdriver placed in the ball-pin slot so as to eliminate any slackness in the valve gear, then turn the screwdriver until a .010in. feeler gauge for the inlet valve and a .012in. for the exhaust valve will pass between the toe of the rocker and the tip of the valve stem.

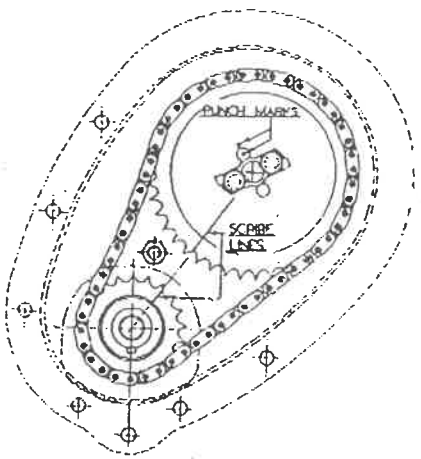
Once the correct gap is attained, hold the screwdriver firm and tighten the lock nut. Still applying pressure to the rocker, recheck the gap and adjust as necessary. Ensure that the rocker cover gasket is in place and is in good condition; check also to see that the right-hand side does not foul the head securing nuts. (Failure to check these points may result in a serious oil leak.)

Assuming that the cylinder head and valve gear are in position and the crankshaft sprocket is keyed to the crankshaft but the camshaft wheel has yet to be fitted, the correct valve timing can be found by adopting the following procedure: Set the valve rocker clearances of Nos. 1 and 4 cylinders to .015in. (this is a special valve setting clearance), then turn the engine until 1 and 4 are brought to top dead centre. This position can be found by placing the keyway vertically downwards in the crankshaft. Now rotate the camshaft until the valves of No. 4 cylinder are at the point of balance, or rocking over T.D.C. Actually, the inlet opens at 15deg. before and the exhaust closes 15deg. after top dead centre. This is equal to 1¼in. when measured around the flywheel, adjacent to the starter teeth.

Next offer up the camshaft chain wheel to the shaft itself, but without moving the shaft, adjust its engagement with the chain until a pair of holes in the chainwheel exactly match or pair in the shaft. It may be necessary to turn the wheel back to front to match the holes. Having attained the correct chainwheel position in relation to the shaft, encircle the wheel with the timing chain. Without moving either the crankshaft or the camshaft, position the loop of the chain round the crankshaft sprocket in such a manner that the holes in the chainwheel match those in the camshaft.

The camshaft chainwheel is now secured to the camshaft by two bolts and locking plates, but don't lock up the bolts until a final check is made. If the engine is on the bench, place a mark at the rear of the cylinder block opposite the T.D.C. mark on the flywheel with Nos. 1 and 4 pistons at T.D.C. Now move the flywheel back a ¼-turn in the opposite direction to normal rotation, then turn slowly forward. As it is turned, insert a .010in. feeler between the valve stem and rocker of No. 4 inlet valve. A slight resistance will be felt as the valve begins to open, and at this point rotation should cease. Now mark the flywheel exactly opposite the T.D.C. mark on the block.

Remove the feeler gauge and turn the flywheel forward until the gauge can be freely inserted at the exhaust valve, then turn the flywheel to T.D.C. Turn the flywheel slowly forward, exerting a slight pull on the feeler gauge and when the feeler can be withdrawn, the exhaust valve must be closed. Now make a second mark on the flywheel and measure the distance from T.D.C. to each mark. These should be the same. Don't forget to lock the tab washers of the chainwheels if the timing is found to be O.K. The timing wheels are then marked by a scribe which should run through the centres of both wheels.



TIMING marks aligned for setting. Note that the keyway is at the bottom of crankshaft sprocket.

Finally, fit the timing chain tensioner and secure it with a plain washer and split pin, then fit the timing cover and reset the rocker clearances to their correct operating clearance.

When the car is to be driven continuously at high speed the makers

Distributor, Tachometer

When the distributor and tachometer gear assembly is fitted, it should have .003-.007in. end float. This can be checked by making use of an ordinary flat washer.

Using a micrometer, measure the thickness of a ¼in. washer and assemble it with the distributor tachometer driven gear to the oil pump driving shaft. Install this assembly in the cylinder block with the washer between the gear and the shaft bearing in the block. Make sure that the shaft is engaged with the oil pump, then fit the distributor adaptor over the gear assembly. With the use of feeler gauges ascertain the distance in thousandths of an inch between the distributor adaptor and its mating face on the cylinder block and compare the measurement with the thickness of the washer. The difference will be the amount of [illegible] float or interference, as the case [illegible]be.

For example, suppose the washer is .060in. thick and the distance between faces is .005in. As the distance is less than the washer, the gear assembly will have an end float of .005in. However, if the distance is .065in. and the washer is .060in., then there is no end float at all, but interference of .005in. and it will be necessary to fit shims or packing to about .010in. This will take up the .005in. interference and give an additional .005in. for end float.

Remove the gear assembly, shaft and washer from the cylinder block and turn the engine until No. 1 piston is at T.D.C. on compression stroke. In this position, both valves will be closed.

Fit the woodruff key to the oil pump driving shaft and insert the shaft in the block to engage the oil pump with its tongue. Rotate the shaft until the key is at right angles to the camshaft and points away from the engine, then position and lower the distributor/tachometer driven gear on the drive shaft until the keyway and the key engage. Continue a downward motion, turning the gear clockwise to effect engagement with the driving gear on the camshaft. (Take care not to dislodge the key.) When correctly engaged, the offset slot in the gear assembly will be aligned with No. 1 push[illegible] sealing tube and the offset, tow[illegible]e rear of the engine.

Assemble the distributor adaptor, together with the necessary packings to obtain the correct end float, and secure with nuts and locking washers. Fit the distributor body with the rotor arm pointing to the No. 1 push-rod tube. Adjust the contact points to .015in. and with the points just beginning to separate when moving in the direction of rotation, the vernier adjustment should be on the third marking on the vernier scale. Secure the body to the adaptor bracket with the nut and lock washer. Advance the vernier a further 1 division, which is equivalent to advancing the ignition 4 flywheel degrees B.T.D.C.

Fit the distributor cap and connect the leads.

Servicing the Clutch

The clutch is hydraulically operated and has a twin-bore master cylinder attached to the bulkhead under the bonnet, and a slave cylin-

nected together by a length of tubing and a flexible hose.

When pressure is applied to the foot pedal of the master cylinder, it is transmitted through the pipeline to the slave cylinder. The slave cylinder piston operates a rod attached to the clutch-operating shaft lever, a fork mounted on the shaft engages in an annular groove in the release bearing mounting sleeve, and moves the release bearing into engagement with the release levers.

Adjustment between the clutch pedal and the master cylinder is set on assembly and shouldn't need re-adjustment. If the master cylinder is disturbed, it is important to adjust the pushrod so that it has .030in. free travel before it reaches the piston. This clearance is necessary to ensure that the piston will return to its stop in the cylinder, and thus prevent the possibility of the main-cup lip covering the by-pass port. If the port is covered, any excess fluid drawn into the cylinder during the return stroke of the piston will find no outlet, and pressure will build up in the system, causing the clutch to slip.

To adjust this clearance, first loosen the clutch pedal-stop jam nut at the forward end of the master cylinder support bracket. Next turn the adjuster screw inwards, and testing the push rod, eliminate all end float. Hold the adjuster screw and tighten the jam nut finger-tight. Now unscrew the adjuster together with the jam nut until a .030in. feeler can be placed between the jam nut and the master cylinder bracket. While holding the adjuster screw, finally lock the jam nut to the bracket.

Adjustment at the slave cylinder fork must be checked periodically, as the clutch pedal will not provide any indication of loss of release bearing clearance as the facings become worn. The adjustment is correct when there is .079in. end float in the slave cylinder fork assembly.

To check this, unlock the jam nut on the slave cylinder fork assembly, then turn the rod until all end float is eliminated. Hold the pushrod and turn the jam nut until a .079in. feeler gauge will pass in between the nut and the fork end. Screw the rod, together with the jam nut, to the fork then lock tight. Check by moving the fork assembly and re-adjust if necessary.

Brake Adjustments

Before jacking up the car, apply the brakes hard to position the shoes centrally in the drums, then release the brake.

To adjust the front wheels, jack up the front of the car and remove the nave plates and the road wheels. Now rotate the hub until the hole provided in the brake drum coincides with the screwdriver slot in the micram adjuster. Insert the screwdriver in the slot and turn the adjuster until the brake shoes contact the drum, then back the adjuster off one notch.

Repeat the operation on the second micram adjuster, then carry out the entire operation on the other front wheel.

The rear brakes are adjusted in the same manner, but note that there is only one adjuster to each rear wheel. After adjusting the brakes the car should be tested on the road to ensure that there is equal braking action at each wheel.

The handbrake is automatically adjusted when the rear brake shoes are adjusted, and as the cables are set correctly during assembly only maladjustment will result from altering the mechanism. • • •

IGNITION TIMING.

This is a very important,often misunderstood & frequently badly done portion of a tune-up.Most Distributors are designed to be timed with a strobe or Electronic Timing Lamp & the engine running.The TR distributor,however is designed to be timed with a Static Lamp & with the engine stopped.All you will get for your efforts with a normal Strobe & the motor running will be a poorly running engine with badly retarded ignition.The Factory say to do it more or less as follows & this seems to work best.....

1.Remove Low Tension lead,Coil to Distributor at the Distributor.

2. Connect a Static Lamp between that Terminal & a convenient live lead(or to the Battery live side)

3.Use the Crank-handle or by turning the motor over by pulling the fan around clockwise as viewed from the front.Position the hole bored in the crankshaft pulley back half 3/8" (10 mm) to the left of the pointer attached to the timing cover.DO NOT reverse the direction of the motor if you go too far as slack within the system will give you the wrong position.It is probably best to remove the Spark Plugs for this procedure as you will not then be working against the engine compression.

4.Loosen the clamp at the base of the Distributor & very slowly turn the Distributor in a COUNTER-CLOCKWISE direction until the static lamp comes on & thenback in a CLOCKWISE direction until the lamp JUST goes out.This is the exact point of ignition & it is possible that the lamp will come on again as you re-tighten the clamp.If this occurs, adjust again until the lamp just goes out.

5.Replace the spark plugs,replace the Low Tension lead & you are finished.

3/8" (10 mm) measured on the circumference of the crankshaft pulley is about 8°,which is more initial timing than is recommended by the Factories 4°.The engine,however seems to run more effectively at this more advanced position probably because of the higher octane fuels now used.....

Adapted from an original Screenplay by Sir Kenneth Gillanders of the Fighting Southern California Highland Regiment and now a Major Motion Picture Starring Madonna as the misunderstood Butler & Prince as Rin Tin Tin,

Ed.note...A Static Timing Lamp can be easily made from any spare 12v.lampholder you may have.Attach ½m.(2') of multi-strand insulated electrical wire to each terminal & affix an alligator clip to each end.Test by touching the clips across your car battery at which time the lamp should light.

mm.

##############################

PART 2

COOLING

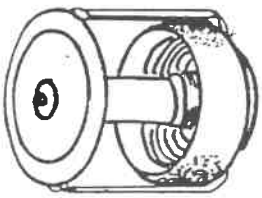
THERMOSTATS AND WATER OUTLETS

PROBABLY THE TWO MOST DIFFICULT ENGINE PARTS TO GET HAVE BEEN THE ORIGINAL EQUIPMENT SMITHS THERMOSTATS AND THE ALUMINUM WATER OUTLET HOUSINGS NOW FROM TWO DIFFERENT SOURCES , WE HAVE ACCESS TO BOTH !

ORIGINAL EQUIPMENT THERMOSTATS ARE AVAILABLE IN THE 70 DEGREE C (185 F) FROM RACETORATIONS. THEY ARE $9.50 POSTED AIR MAIL TO YOUR ADDRESS AND YOU CAN USE YOUR VISA CARD FOR ORDERING. I ALSO WAS ADVISED BY DARYLL UPRICHARD THAT BECAUSE OF UPGRADING OF MATERIALS , THE COST OF THE UPPER CONTROL ARM KITS WILL BE GOING UP THE SHAFTS ARE NOW MADE OF STAINLESS STEEL AND WILL NOW BE A VERY LONG TERM FIX FOR THE ERALY DECAYING RUBBER BUSHINGS.

THE TR REGISTER AUSTRALIA HAS BEEN FORCED TO REMANUFACTURE PARTS FOR SOME TIME NOW. THEY NOW MAKE A VARIETY OF DISCOUNTED TR PARTS , INCLUDING THE WATER OUTLETT HOUSHINGS (BOTH HALVES). THEY SELL FOR ABOUT $25 (US) PLUS $5 FOR AIR MAIL. THE AUSTRALIAN REGISTER OWN THE MOLD AND THE FINISHED PRODUCT IS OF VERY GOOD QUALITY. IN FACT , THE ALLOY USED IS MUCH HIGHER GRADE THAN THE ORIGINALS WHICH TEND TO CORRODE AWAY ! THE REGISTER HAS ALSO UNCOVERED A SUPPLY OF REPAIR MANUALS PRINTED BY THE NOW DEFUNCT SCIENTIFIC PUBLICATIONS (VERY BIG IN THE 50'S AND 60'S) , AND ARE PRICED REASONABLY, AROUND $8

KEN GILLANDERS - VOLUME 40 , NOVEMBER 1985



CORRECT "FACTORY" THERMOSTAT HAS LARGE SLIDING RING OVER THE BELLOWS, TO BLOCK BY-PASS WHEN ENGINE WARMS UP.

INCORRECT "UNIVERSAL" UNIT WHICH IS SOLD BY AUTO PARTS STORES WILL NOT FUNCTION PROPERLY.

COOLING

N THE PAST SEVERAL YEARS WE HAVE ATTACKED THE COOLING PROBLEMS FROM EVERY NGLE , BUT PERHAPS NOW IS THE TIME FOR A RETURN TO BASICS. WHAT FOLLOWS IS THE OMMON CAUSES OF OVERHEATING IN A TR IN ROUGHLY THE ORDER YOU ARE LIKELY TO NCOUNTER THEM:

) AIR PUMPING CAPACITY OF THE FAN: THERE ARE A VARIETY OF SOLUTIONS TO THIS, RO HE INSTALLATION OF A HAYDEN FLEX-FAN DOWN TO BENDING THE STOCK FAN TO ET BETTER PUMPING ACTION , BUT AS IN MOST THINGS , THE MORE EXPENSIVE SOLUTION S BEST (ED. NOTE: AN ARTICLE WILL APPEAR IN THE NEXT TRIBUNE , AND MAY PROVE TO E THE ULTIMATE SOLUTION).

) RADIATOR PARTIALLY BLOCKED: YOU MAY SEE RUST IN YOUR RADIATOR , BUT ORROSION MAY HAVE PARTIALLY BLOCKED THE TUBES AND THE ONLY PRACTICAL OLUTION IS TO TAKE IT TO A COMPETENT RADIATOR SHOP AND HAVE THE TANKS EMOVED AND THE CORE RODDED. TO PREVENT FUTURE PROBLEMS US A QUALITY NTI-FREEZE IN THE RIGHT MIX (SEE BELOW).

) WRONG PROPORTION OF WATER TO ANTI-FREEZE : WHY IS IT WE ASSUME THAT IF A ITTLE IS GOOD , A WHOLE LOT IS BETTER ? MOST BOOKS ON PHYSICS WILL TELL YOU THAT HEN IT COMES TO ACCEPTING AND REJECTING HEAT , PURE WATER IS THE BEST. NFORTUNATELY , WASTE DOES NOT CONTROL CORROSION WELL AND HAS A RELATIVELY OW BOILING POINT. CHEMICALLY , YOU CAN ADD UP TO 30 PERCENT ANTI-FREEZ WITHOUT RAMATICALLY CHANGING ITS HEAT REJECTION RATE , BUT BEYOND THAT THE ABILITY TO EJECT HEAT FALLS RAPIDLY. WE USUALLY JUST ADD A GALLON OF ANTI-FREEZ TO THE ONTENTS OF THE COOLING SYSTEM , BUT THAT RAISED THE RATIO TO 50/50 , WHICH ESULTS IN A DRAMITIC LOSS OF COOLING EFFICENCY. A BETTER SOLUTION WOULD BE TO SE QUARTS IN THE TR SYSTEM , AS THAT WOULD CONTROL CORROSION, INCREASE THE OILING TEMPERATURE OF THE COOLANT, AND STILL WOULD BE THE MOST EFFICEINT IN OOLING. FORTUNATELY , IN SO. CAL, THERE IS LITTLE LIKELYHOOD OF FREEZING !

) MECHANICAL CONDITION OF THE COOLING SYSTEM: THIS IS LIMITED TO HERMOSTATS AND RAIDATOR CAPS. THE TEMPATION HAS ALWAYS BEEN TO REMOVE THE HERMOSTAT IF OVERHEATING DEVELOPES , BUT THIS USUALLY PROVES TO BE COUNTER-RODUCTIVE AS THE COOLANT WILL PASS THROUGH THE SYSTEM TOO QUICKLY TO COOL

IN THE RADIATOR. YOU CAN USE ONE WITH A LOWER TEMPERATURE RATING (160 INSTEAD OF 180) BUT THE SYSTEM WAS DESIGNED TO HAVE A THERMOSTAT IN IT AND YOU WILL REDUCE EFFICENCY ! YOU TAKE IT OUR. YOU SHOULD ALWAYS TRY TO HAVE A SMITHS TYPE THERMOSTAT THAT HAS THE BYPASS BLOCKING RING ON THE BELLOWS.

THE RADIATOR CAP IS CHARGED WITH PRESSURIZING THE COOLING SYSTEM WHICH IN TURN RAISES THE BOILING TEMPERATURE. THE CAP MUST HAVE A GOOD SEAL AT THE RUBBER WASHER , AND THE SPRING MUST BE IN GOOD SHAPE. CHECKING THE PRESSURE RATING CAN BE DONE AT MOST GAS STATIONS.

CAREFUL ATTENTION TO ALL THE ABOVE WILL CORRECT MOST OVERHEATING PROBLEMS , AND WILL GENERALLY GIVE EVERY TR A BETTER MARGIN BETWEEN NORMAL OPERATING TEMPERATURE AND THE BOILING POINT. I HOPE THE IMFORMATION WILL KEEP YOU COOL !

KEN GILLANDERS - VOLUME 38, SEPTEMBER 1985

TR COOLING SYSTEM , UPDATE

THIS IS AN EXTENSION OF A PREVIOUS MONTH'S COLUMN AND CONTAINS A FEW ADDITIONAL SUGGESTIONS ON THE COOLING SYSTEM.

FIRST: YOU SHOULD CONSIDER WRAPPING NEW RADIATOR HOSES WITH PLASTIC ELECTRICAL TAPE , IT DOES NOTHING FOR THE LOOKS BUT IT DOES MAKE LARGER HOLES AND SPLIT IN THE HOSES LESS LIKELY.

SECOND: IF IT IS NECESSARY TO REPLACE THE CORE IN YOUR RADIATOR , CONSIDER A CORE WITHOUT A CRANK HOLE. YOU CAN'T START THE CAR WITH A CRANK BUT YOU GAIN SEVERAL TUBES THAT PASS ALL THE WAY THROUGH THE RADIATOR - TO TO BOTTOM.

THIRD: IF YOU BLOCK OFF THE BYPASS AS RECOMMENDED (BY PREVIOUS EDITOR) REMEMBER TO LEAVE A SMALL HOLE , ABOUT 3/16 , IN THE PLUG. IF YOU BLOCK IT SOLID YOU HAVE NO CIRCULATION UNTIL THE THERMOSTAT OPENS, AND YOU CREATE STEAM POCKETS NEXT TO THE EXHAUST PORTS. THIS CONDITION CAN CAUSE THE HEAD TO CRACK WHEN THE THERMOSTAT OPENS AND FAIRLY COOL WATER RUSHES INTO THIS VERY HOT AREA OF THE EXHAUST PORTS. IT IS VERY IMPORTANT TO ALLOW A SMALL AMOUNT OF CIRCULATION WHEN THE THERMOSTAT IS CLOSED.

FOURTH: USE THE CORRECT SMITHS TYPE THERMOSTAT OF ABOUT 160 DEGREES. THEY ARE READILY AVAILABLE AND ARE QUITE REASONABLE IN PRICE.

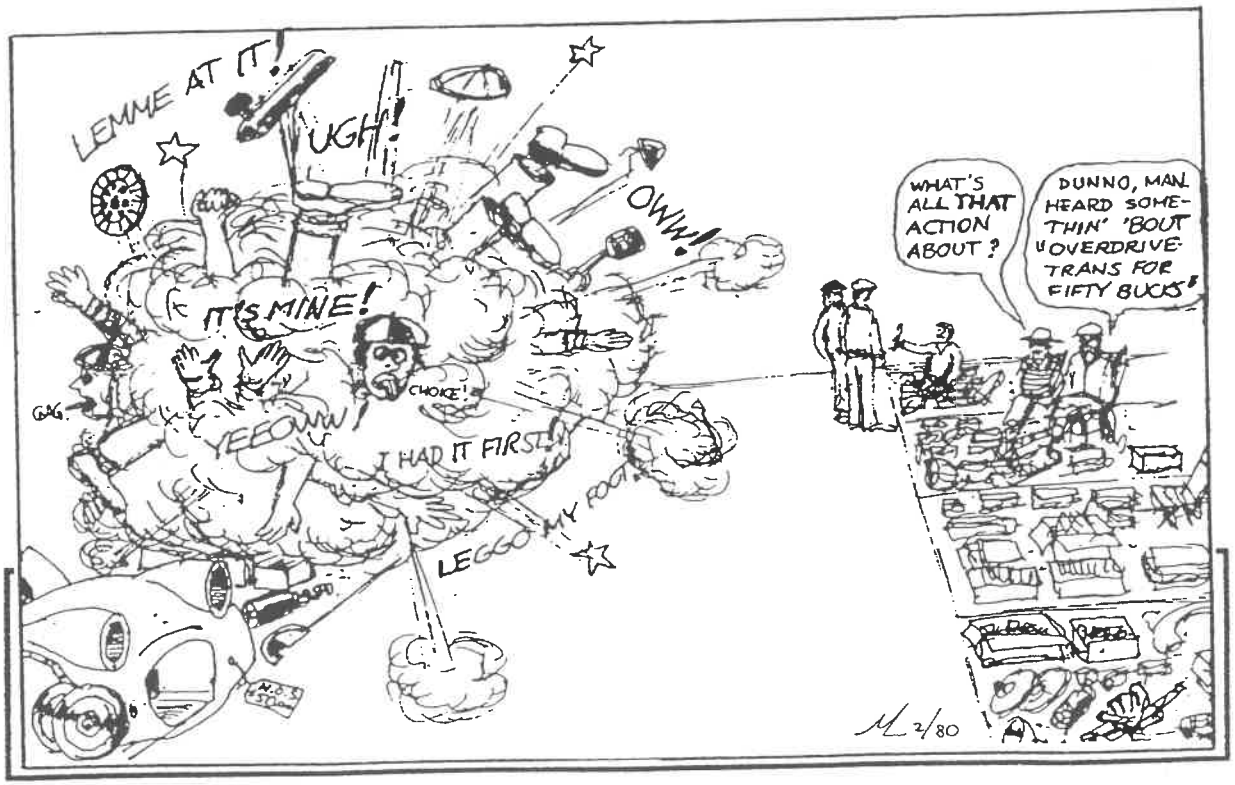
FIFTH: IF YOU HAVE A TR3A BE SURE THE FIBER BOARD DEFLECTOR IS IN PLACE AROUND THE RADIATOR , IF NOT INSTALL ONE.

SIXTH: WATCH THE CONDITION OF THE THERMOSTAT HOUSING, THEY CAN CORRIDE TO THE POINT OF LEAKING., NEW ONES ARE NOT THAT EXPENSIVE.

SEVENTH: WATCH THE CONDITION OF THE STEEL PIPE THAT CONNECTS THE TWO LOWER HOSES, THEY CAN CORRODE AND LEAK.

EIGHTH: ALWAYS USE THE BELLOWS TYPE UPPER RADIATOR HOSE, A STRAIGHT HOSE WILL TRANSFER TOO MUCH VIBRATION AND CAN RUPTURE THE TOP TANK OF THE RADIATOR

KEN GILLANDERS - VOLUME 44 , APRIL 1986



ONE SOLUTION TO SOLVING THE HOT TR PROBLEM

Ever since building my engine on my 59 TR, I have had a drastic overheating problem. Last summer as the weather got hotter, so did my tight new engine. It was so bad that on an 80° day the temperature would steadilt rise past 190°, 210° ... and boil over. After talking to many TR owners I decided to install a Hayden, 7 bladed flex fan (13 inch diameter). It sounded easy (and really was), after the job is done. The total cost of parts was about $18.00 and the problem is solved, now 180° - 190° all the time with an outside temperature of 80°. After the fan was installed I took the TR on the San Diego Fwy to Magic Mountain at 4000 rpm with the temperature never going over 190°. The Hayden fan was purchased at Pep Boys.

The original fan at idle (4 blades with almost no pitch) would not send any air back on the engine, now the air really flows. This article reflects the installation of the fan, eliminated the hand bolt (extension bolt with starter dog head). The installation would almost be the same if you wanted to keep the hand crank ability in tact.

After removing the apron, radiator, old fan, etc. you notice the narrow space that is left from the frame cross tube to where the radiator fits. Replacing the approx 3/4" thick fan with the new 2½" thick fan narrows the space considerably. I centered the new fan between the radiator and frame cross tube. On my vehicle I had to make (with the help of a friend and a lathe) a spacer (out of aluminum) between the radiator and the body brace. The spacer was 3/4" thick with a center hole of 5/8", the same as the cone sapcer (fan pulley hub extension).

The center hand crank bolt as replaced with an aircraft bolt, 5/8" in diameter, and 3/4" longer than the original bolt. The length of this bolt may vary from car to car depending on the length of the extension fan pulley hub. I found the lengths different on the one for my spare engine. One was 3/8" different. No alterations were made to the new Hayden fan. The center hole was 5/8", the same as needed.

The assembly included 1) fan pulley extension hub; 2) new spacer 3/4" thick and the same diameter as the front of the fan pulley hub extension; 3) Hayden fan (be sure that the curved - pitch - side is correctly installed); 4) lockwasher and new extension bolt; 5) because of the position of the four holes through the Hayden fan, only two can be used. These only position the fan to the hub and do not really hold the fan to the engine, the center 5/8" bolt holds the fan one the

Continue on Pg. 34

A NOTE ON THE COOLING SYSTEM

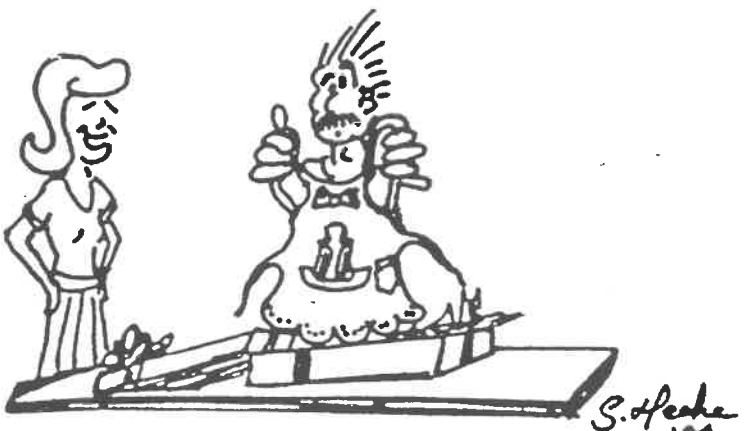
(the unlikely mod that worked)

When Martin Lodawer and I removed the front apron from the Red Rocket (Ken's TR2) to change radiators, we resolved, by chance a long-standing problem in the TR2-TR3 cooling system. It seems that even if you fill the system to the top, once the engine warms up, expansion drives out part of the coolant. When the engine cools down again, you end up with an air space in the radiator. This air space gets larger with use, eventually allowing air to get picked up in the cooling cycle, reducing its effectiveness. Besides that, the spilt coolant makes a mess!

While the apron was off, I decided to put an expansion bottle on the car to act as a coolant recovery. I went to the local parts store and bought a commercial coolant recovery system. However, the sealed radiator cap supplied with the system was clearly too short from the neck to the cap rim. Further, while the cap on the Triumph was the correct one, it did not have a sealing gasket under the lip to maintain a vacuum in the system when it cooled off. In a move of desperation, we removed the seal from the new cap and glued it in the old Triumph cap. We then mounted the recovery bottle between the radiator and the inner fender panel and connected it with the hose to the overflow pipe on the radiator. We really did not expect it to work: after all, the cap was a mix of parts from two caps, and it looked like the bottle had been placed too far down to effectively provide a return. Yet, when it was tested, it worked perfectly and has been doing so ever since.

A very simple answer to a very complex problem.

Ken Gillanders
Newsletter #16



"WELL, YOU SAID YOU NEEDED A NEW FRONT APRON FOR YOUR TR, SO I MADE YOU ONE!

OVERHEATING AND THERMOSTAT PROBLEMS
or... still more on how not to lose your cool

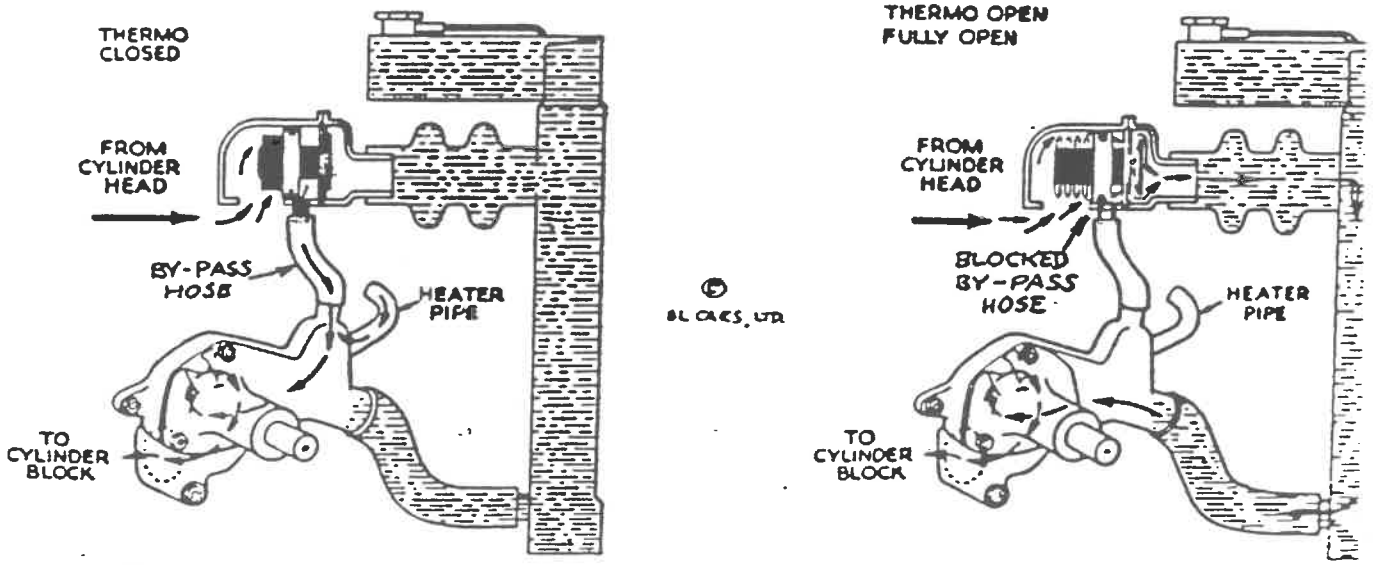
by Ken Gillanders

Just about the time you feel that you are an expert on a given subject, along comes a piece of information which you have overlooked that is so simple and evident that you begin to question your own expertise. I have been chasing the problem of overheating hammer & tongs since I first built the 2600cc motor. However, it appears that I have overlooked a simple and important item.

I was looking through some old TRA publications and ran across a letter on this very problem in which the writer made the observation that an aftermarket thermostat did not have the required sleeve to block the by-pass port after the engine had warmed up. I went to some of my factory drawings, and lo and behold, he was absolutely correct.

What was intended to occur was that when the engine was cold, the blocking sleeve on the thermostat was behind the by-pass port, allowing coolant from the cylinder head to pass through it and into the water pump, then back into the engine. As the engine reached operating temperature, the sleeve moved forward with the thermostat valve and blocked the by-pass port, forcing the coolant to go through the radiator. However, with an aftermarket thermostat, there is no blocking sleeve and as it is easier to pump water downhill from the cylinder head than it is to pump it uphill from the radiator, a good portion of the coolant is able to by-pass the radiator and does not get cooled while the engine is running.

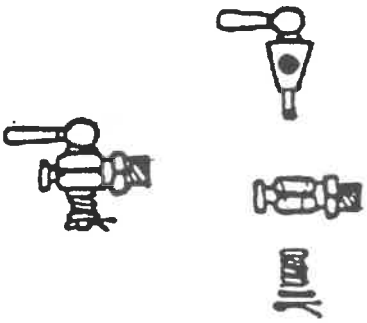
After realizing the problem, I tried to get a factory thermostat, with no luck whatsoever. Fortunately, we now found a supply of the original pieces directly from England. Rated at 80°C (180°F) instead of the original 70°C (160°F), they will be available at approximately $9.00 each, once they arrive here. More details at that time.



Circulation of Water before the Thermostat has opened

Circulation when the Thermostat is

PETCOCK SERVICING or:
Does your petcock leak?



Curing leaky petcocks is no real problem. Remove the cotter pin at the bottom, remove the spring, and gently tap out the valve. Soaking the assembly in penetrating oil first usually helps.
Leakage is caused by scaly gunkies building up on the tapered surfaces. Clean thoroughly, then lap the valve into the seat by using fine grit valve grinding compound. Clean all parts thoroughly, then reassemble. Extra sealing power will result if the spring is stretched slightly. Teflon pipe thread tape on the threaded part will prevent leakage, and make it easier to remove next time.

Author Unknown
Newsletter #9

...AND NOW FOR SOMETHING COMPLETELY DIFFERENT- AN ARTICLE ON HOW TO KEEP YOUR TR COOL THIS SUMMER! (AND SUMMERS TO COME)
by Steve Hedke

Bob Fleischman's article in the last newsletter reminded me of a few additional tips that will help eliminate overheating once and for all.

1. If you have never routed out your radiator, this is a must! I'm not talking about flushing or chemical cleaning. You have no way of knowing if some of the tubes have been soldered shut by some cheap patch job over the years. This practice was fairly common on American cars, since they had so much excess cooling surface. Remember: if in doubt, rout it out, and replace closed tubes where necessary.
2. If your car has a heater, the same thing applies. Any good radiator shop can rout your heater core. This will not only help cooling in emergencies, it will also heat much better in the winter. Sure, it's a pain in the rear apron to remove it; but the benefits are definitely worth it.
3. Check your water pump. If it dribbles out the bottom, or there is play in the shaft, it will need to be repaired. Do not fear a rebuilt pump: these often last longer than the original. Also, do not over-grease the shaft. A simple spritz or two is sufficient. Too much grease will get into the cooling system: it doesn't do any harm, but you don't need all those gunkies floating around in there.
4. Belt and hoses are an obvious source of trouble. Make sure the belt is lined-up straight (that the generator pulley is parallel to the crank and the water pump). The common source of trouble here is the alignment of the generator. If the belt is crooked, it will wear both the belt and the pump bushing. You may have to shim the bottom generator mount to align it properly. Do not use a 'ribbed' or spring-type lower hose (like the ones you see in K-Mart for 99¢): use molded hoses only! The others tend to split along the plies. Upper hose should be original equipment only; the hose is designed to flex with engine movement. Heater hoses are just as important. Make sure the cock for the heater water is clear and not leaking out the bottom of the shaft.
5. Do not run the car without a thermostat. Only owners of '62 Falcons think that overheating can be cured by removing the thermostat. Make sure that the coils of the thermostat are in the engine side (pointing down). You can check the old thermostat by dropping it in a pan of hot water in your kitchen, on the stove. Check the water temp with an ordinary kitchen thermometer. Tell your wife you're having boiled thermostats for dinner.
6. Engine timing is also important. Too much advance will make it run hot. Might as well check and see if your vacuum

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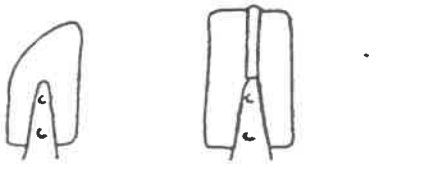


(SEE NEXT PAGE)

advance is operating properly. Pull the distributor off and suck on the end of the dashpot. If it's good, the breaker plate will move. If there is no resistance to the suction, or the breaker plate does not move, you got a vacuum leak: which, as you may guess, will help overheating. It will taste bloody awful, but you knew the job was dangerous when you took it.

7. Just a line on hose clamps. Avoid the "wire" type of clamp (original equipment), as well as the "band" type (with the adjusting bolt). Only use the Hy-gear type: they will last forever, and make maintenance much easier.

It is my opinion that you should go over these points first, before installing a flex-fan. It's more than possible that one of them will clear up your problem.

However... if you are running something radical, like 95mm pistons or something, you may need more than Standard thought you would. Here are a couple of things that worked well for me.

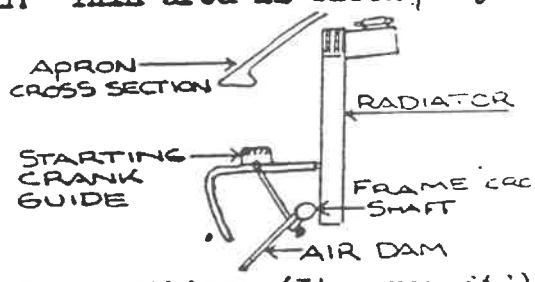
Coolant Recovery System

Virtually every new car (o.k., except certain bloody huns) uses a coolant recovery system. They are inexpensive and easy to install. I mounted mine on the left fenderwell, as high and as close to the radiator as I could get it. It fits well, leaving lots of room for tune-ups.

As you drive your TR on a hot day, even if it stays at a normal temp, it may boil over when you park the car. The coolant recovery will return the boil over to the radiator as it cools. Magic! It's definitely worth it, even if your car doesn't overheat.

Air Dam

One of the real design quirks of the TR is that the lower 1/3 of the radiator is not in the airstream! This area is blocked by the lower part of the front apron. Getting air to this part of the radiator helps a great deal. I built a very simple airdam that does this quite well. It was attached to the starting crank bushing studs. (see illustration) Made of ¼" marine plywood, and painted the same color as the car. The plywood allows it to break if it hits something. (It never did.) I only used it during the summer.



TR4 Fan

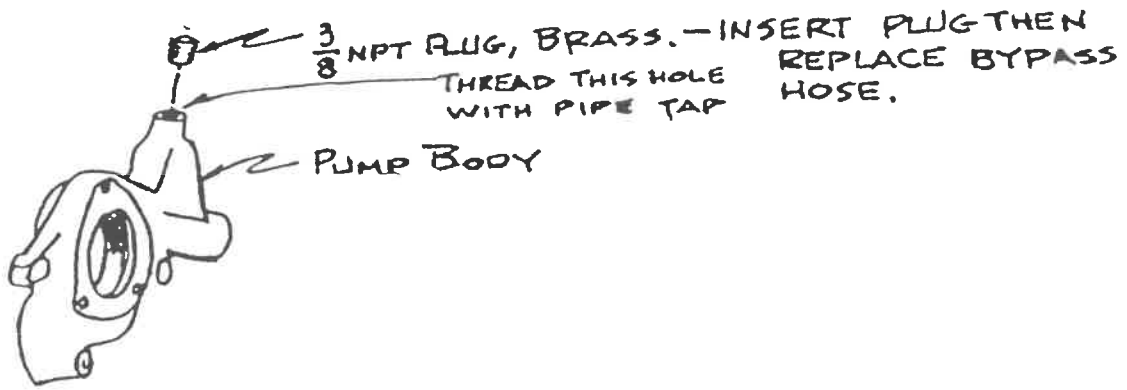
For those of you that don't need something as radical as a Flex-Fan, here's an alternative. The stock TR4 fan bolts right on, and it's much better than stock. (see illustration) Check the clearance from the outer blade rib to the steering box- it may be a little close. If so, all that need be done is to grind or file it nub down. I did it, and there were no balance problems.

Hope these hints help!

Steve Hedke
Newsletter #5

The BYPASS

This little jewel was designed to function with a "no longer available" skirted thermostat. (There were a few around last year, but they are not in your local parts house.) In merry 'ol England and cooler climes of the rest of the world this bypass is a desireable feature giving a faster warmup, quicker response from the heater, etc., but with the nonskirted type of thermostat the bypass does not get shut down when the thermostat opens as originally designed. Consequently there is always a certain percentage of the coolant that never gets to the radiator, but merely chases its tail through the engine. In an Arizona July that is akin to an extra hole in the head you can do without. So, plug off the passage.



The hole in the water pump where the bypass hose attaches will accept a 3/8 NPT pipe tap and put in a BRASS pipe plug and replace the hose. Then ALL coolant will go through the radiator. The flow restriction afforded by the thermostat is also important as it prevents the coolant from passing the radiator too quickly as time-in-passage affects the amount of heat rejected and lowers the temperature at the water pump pick up point. Additionally a 1/8 inch diameter hole drilled in the thermostat body is required to prevent an airlock when filling the system.

FAN

What a joke this thing is.... For city driving it just won't move enough air to keep the engine temperature within acceptable limits. We have replaced many with different substitutes and have come to the conclusion about an excellent replacement. Early replacements were of an after market variety, made of fiberglass, had six plades and were a Datsun (Nissan) item. They had the distinct disadvantage of being difficult to mount on a TR, requiring an adapter to be machined and the center hole altered. A couple of moulded plastic fans as used on Fiats and other aftermarket items have disintegrated in service, so don't waste your money of one of these. The best solution has been that of the original fan used on the 122S Volvo. (If you can find one.) It is metal, six bladed, and has the proper center hole size, proper outside diameter and the only modification is to redrill (relocate) two of the four mounting holes.

Problem Identification

Suprisingly enough, some of us have trouble really determining whether or not there is a problem. What is really good or bad and by what standards do you

make a judgment? With a TR you can expect, and it was designed so, to run coolant temperatures of 175 degrees minimum and near 200 degrees maximum WITHOUT BOILING, either going down the road or, more importantly, when the engine is first shut off. A properly sealed, pressurized system with an overflow recovery system should not lose significant amounts of coolant from day to day. Large losses over a short period of time spells trouble somewhere as does instant boiling when the engine is shut off after a hot run. Of course, the catastrophic failures like leaking water pumps, blown hoses are easy to spot, but most often not any one thing is the primary cause of cooling troubles. It usually turns out to be a combination of several, any one of which by itself would not be a significant problem. Two or three separate things added up though can create an overall failure of the system to do its job.

Another factor not normally considered is you, yourself. Once-upon-a-time the throttle control was not on the floor, but either on the steering column or in some other strange place. Once it was put on the floor board a driver's right foot became an instant enemy and has remained so to this day. Among all the other stinkers he can create with it, cooling troubles are on the list. What the hell does the accelerator pedal have to do with cooling off the engine? Simply this — if the heat is not generated in the first place, you don't have to remove it.

A. Back Off! Wide open throttle position at low engine speeds is plain and simple abuse of the machinery. Manifold vacuum drops to zero, the carbs are nonfunctional for a short period of time, you suck raw fuel into the engine that washes the oil off of the cylinder wall and what's important in this discussion, the combustion temperatures go out of sight—off the top of the scale creating excess heat that has to be ejected from the system.

B. Drive in the highest possible gear for the shortest possible time. Don't run for distances at low traffic speeds in second or third when it will pull smoothly in a higher notch. The TR is far from being anemic by any standard! It will run along at 25mph in fourth as long as you don't jam open full throttle and expect it to respond. By gently opening the throttle it will walk right out at traffic speeds and no one is going to run over you. A TR is not one of these sickly modern econoboxes that need to be propelled across town using the gear shifter as an oar. Keeping to the minimum the number of revolutions of the engine per mile reduces the number of "little hot fires" previously mentioned and reduces the total amount of heat the cooling system must handle. Be your own, and your TR's, best friend!

Not connected to the cooling system, but in the event of some unenlightened slob putting down your little English beast, just ask him if he noticed that 9 of the first 10 finishers at Indy in rercent years were designed and built in England and especially for the Great American Go-Around-In-Circles affair. Since Indy has long past being a race and merely an Enduro, it speaks well for the English capability of building long lasting, high performance machinery.

THERMOSTAT HOUSING

This little jewel was made as a die casting from a lousy grade of die cast material that neither will weld nor has corrosion resistance. The attrition rate when exposed to Southwestern water is appalling. Often you will find that a whole section has left, but take heart, they can be restored to a more durable condition. The rotten portion can be machined away and new sections fabricated from AL 6061-T6 and inserted to bring back the departed surfaces and then give an interior coat of a good 'cold galvanize', the restored part will outlast even a brand new one. This does require lathe work.

1/8/94

OBSERVATIONS OF AN ITINERANT MECHANIC

REGARDING BLOCKING OFF THE RADIATOR BYPASS HOSE

Last newsletter carried an article that recommended the blocking of the radiator bypass system when a skirted thermostat is not available and a non skirted type has been fitted.

I most definitely do NOT recommend that this action be taken for the following reasons.

While the radiator bypass serves no useful function when the engine is at operating temperature and the thermostat is open; it serves a vital role when the thermostat is closed.

When a cold engine is started the thermostat is closed and coolant is prevented from circulating through the radiator; however under the influence of the water pump coolant does circulate through the block and head via the bypass hose ensuring an EVEN distribution of the generated heat throughout the engine.

As the coolant must pass the thermostat on its way to the bypass outlet the thermostat heats up at the same speed as the coolant so when the coolant reaches the specified temperature for the thermostat, the thermostat begins to open, admitting a small amount of cold coolant from the radiator at first which has the initial effect of lowering the temperature of the coolant in the engine and slowing the rate at which the thermostat opens; this is important to prevent a sudden surge of cold coolant into a hot block and head

When the coolant temperature in the whole system has stabilised the thermostat will continue to vary as necessary to maintain the correct operating temperature for the engine.

If the thermostat is closed and the bypass blocked, coolant cannot circulate and coolant heating is localised to areas adjacent to the top of the cylinder bores; coolant does not pass by the thermostat and heat only reaches it by convection.

In this situation several things can happen and none of them are good for the engine.

Some heat cannot be quickly conducted away from the cylinders 'hot spots' develop; these can be hot enough to cause local boiling of of the coolant; the steam generated forces coolant back through the water pump to the bottom radiator tank and then up and out through the radiator cap and overflow pipe.

The steam forces the water out of the head and then reaches the still closed thermostat which opens immediately allowing the steam to pass into the cold coolant of the upper hose where it condenses immediately.

The heated coolant that was forced into the lower radiator tank returns to the block and head and passes straight through the now wide open thermostat to the top radiator tank. The very hot coolant is immediately followed by the remaining cold coolant from the radiator with consequent rapid cooling of the head and block; an excellent procedure for cracking both of these.

Another scenario is that the coolant does not boil but coolant that is hot enough eventually reaches the thermostat and it begins to open; coolant begins to flow under the influence of the water pump and, because the rest of the coolant in the head is much hotter than that which first reached the thermostat, the unevenly heated block and head are quickly cooled by the cold water from the radiator with a similar recipe for disaster as before.

If you are one of the growing number of TR owners unable to find an original type thermostat I can recommend the following procedure.

Use an off the shelf unskirted thermostat with a heat rating as near as possible to the recommended rating of 70 degrees C.; do not use a thermostat with a rating over 80C.

It is permissible to reduce the bypass access to a minimum of about 3/8 inch; the important thing is to maintain at least some flow during warmup; it should be pointed out that the skirt on the original type thermostat did not seal off the bypass but rather just directed coolant flow more towards the top hose outlet.D.R.

TECHNICAL TIPS

COOLANTS & CORROSION

I have collected a bit of book learning about coolants and corrosion in automobiles. The following information is not based on extensive personal experience - it's based primarily on an ASTM symposium titled "Engine Coolant Testing". I have organized the information into a few sections: Corrosion, Metals, Coolants and Questions.

"My Triumph will only leave me when it is rust!" or -
Corrosion-

There are two different modes by which corrosion can cause a cooling system to fail. The first is corrosion of enough metal to cause mechanical failure of the system. This leads to system leaks or flow problems. The second is extensive scale formation which blocks coolant pathways. This failure leads to reduced flow rates.

The first mode of failure occurs most frequently in radiators and in water pumps. In radiators perforation is not as common as the heavy corrosion which causes it, because the corrosion by-products often plug the hole they create. In water pumps heavy corrosion causes reduced coolant flow rates, possible leakage around the housing and could, in truly extreme cases, lead to fracture of the pump.

The second mode of failure commonly occurs when a metal salt is dissolved in the hot portion of the system and then precipitated in the cold part of the system, the radiator. Alternatively, some metals in the radiator may form a heavy, insoluble scale as they corrode leading to blocked tubes.

An important consideration in engine coolant system's corrosion is the heat flow. Metal that is heat-rejecting has a faster corrosion rate than metal that is heat-absorbing or heat-neutral. Heat-rejecting is defined as transferring heat from the metal to the coolant, i.e., the engine block. One reason for accelerated corrosion is coolant boiling at the surface of such surfaces. Combined boiling, heat transfer and corrosion are not completely understood, but bench tests clearly demonstrate accelerated corrosion in heat-rejecting metal surfaces.

"Metallurgy 101: Blacksmithing for Beginners" or -
Metals-

There are a number of metals present in automotive cooling systems. These include cast iron, mild steel, brass, copper, aluminum, high-lead and low-lead solder alloys. Generally speaking, the corrosion of metals is prevented by the formation of a stable film on the exposed surfaces. This film might be formed by corrosion products, as in aluminum exposed to air, or by the adsorption of some other chemical, such as silicates. relatively speaking, the most corrosion prone metals in an engine are the aluminium and the solder.

The corrosion potential for metals is the result of several competing factors. The most important are the electrode potential, which is a measure of the tendency of the metal to oxidize, and the protective strength of the oxide films.

Unlike in ornamental fences or inner wheel arches, cast iron and steel both have relatively low corrosion rates in automobile engines. It is simple, but essential, to reduce corrosion by adding inhibitors to the coolant formulation. Also the corrosion products of ferrous metals are readily dissolved in the coolant and moderately stable in solution.

Brass, which is an alloy of copper and zinc, and copper have higher corrosion rates then iron and steel. For the record, the TR7 has a soldered brass and copper radiator, and I suspect that every Triumph does. The alternative is aluminium and plastic radiators that were developed in the late 70's and early 80's. Like ferrous metals, the corrosion of brass and copper can be controlled through the use of additives.-

Corrosion of aluminium can be quite a problem. Based on its electric potential, aluminium is the most corrosion prone metal in your engine. Only magnesium, sodium and potassium have a greater oxidation potential. Fortunately, aluminium tends to form stable surface films of corrosion products. Aluminium is particularly sensitive, however to a process, called erosion-corrosion, where a rapidly flowing fluid can remove the protective oxide layer, exposing bare metal to the fluid stream. Erosion can be controlled by limiting the surface flow rate of coolant to less than 3 m/s throughout the engine. This is easily achieved everywhere except at the water pump.

Which leads to a brief aside about the most vulnerable aluminium component in most engines, the water pump. Water pumps are susceptible to corrosion caused by erosion-corrosion and cavitation. I quote from F. Marks and W. Jetten ("Engine Coolant Testing, 2nd Symposium"): "Cavitation is the process whereby pressure fluctuations cause the formation and subsequent collapsing of vapor cavities, which exert high mechanical forces on metal surfaces. Erosion-corrosion is the process whereby a flowing fluid surface destroys the protective film giving corrosion free play. The results of both processes are very similar, namely severe localized damage. Cavitation and erosion- corrosion are difficult to separate under test conditions."

The rate of cavitation is affected by a number of factors. Increasing the fluid density and fluid boiling point tends to increase cavitation while increasing viscosity, compressibility and dissolved gases tends to reduce cavitation. Some additives seem to have a positive effect in reducing cavitation.

There is one final problem with aluminium. Some aluminium salts, including aluminium phosphate, are not highly soluble in water. Depending on the overall coolant hardness, which is a measure of the total concentration of minerals in the coolant, aluminium salts will precipitate out of solution in the colder parts of the system.

The last important alloy in the coolant system is solder. Solder, like aluminium, is highly susceptible to corrosion. There are two common solder alloys. Low-lead solder is made of about 70% Lead (Pb) and 30% Tin (Sn). High-lead solder is 97% Pb, 2.5% Sn and .5% silver (Ag). As a practical matter, even though it has a reasonable electrode potential, lead is pretty much the least corrosion resistant metal in the automobile. Lead salts are the primary corrosion by-products of solder. It follows that high-lead solder corrodes at a faster rate than the low-lead solder. Unfortunately high-lead solder is distinctly cheaper than low-lead solder and prevalent in most modern, post 1960, automobiles.

TIRE PRESSURE AND ROAD MANNERS

AT ONE OF OUR TR CLINICS ABOUT 7 MONTHS AGO , A NUMBER OF OUR CLUB MEMBERS WERE A LITTLE STSRTLED WHEN I WENT AGROUND CHECKING THE AIR PRESSURE IN THEIR TIRES. ACTUALLY , I WAS JUST SAMPLING TO SEE HOW MUCH AIR MOST TR ENTHUSIASTS CARRY IN THEIR TIRES , AND ALSO THE TYPE OF TIRES THEY ARE RUNNING.

THE ORIGINAL SPECIFICATIONS OF STANDARD-TRUIMPH VARIED FROM SOURCE TO SOURCE , BUT IT IS USUALLY QUOTED AS 20 TO 24 LBS. HOWEVER , THESE CARS WERE ORIGINALY EQUIPED WITH BAIS PLY 550 X 15 TIRES , USUALLY DUNLOP. TODAY MOST TR'S ARE RIDING ON EITHER 165 OR 185 X 15. MY GENERAL SAMPLING HAS LED ME TO SEVERAL INTERESTING CONCLUSIONS.

1) ALMOST EVERYONE IS USING TIRE PRESSURE IN EXCESS OF 28 LBS. , AND SOME ARE AS HIGH AS 35 LBS. , WHICH DOES WONDERS FOR THE CAR'S HANDLING , BUT RUINS THE RIDE THE MODERN TIRES NOW BEING USED HAVE MORE CROSS SECTION AND MORE TREAD ON THE GROUND THAN THE ORIGINAL EQUIPMENT. AS A RESULT , THE MODERN RADIAL TIRES WILL HANDLE BETTER THAN THE ORIGINALS AT THE SAME INFLATION.

2) THE LARGER CROSS SECTION WILL SUPPORT MORE AT THE SAME INFLATION THAN THE ORIGINAL TIRE.

3) MANY OF THE MODERN RADIALS LOOK LIKE THEY'RE HALF INFLATED AT THE SAME PRESSURE THAT WOULD STAND A BIAS TIRE UP STRAIGHT. GENERALLY , FOR NORMAL ROAD USE (NO HIGH SPEED) A MODERN TIRE WILL PERFORM VERY WELL INDEED RIGHT DOWN TO 22 - 24 LBS. , BUT MOST OWNERS WILL FIND THAT THEY WILL BE BETTER ABLE TO ACCEPT ABOUT 28 LBS.

AS YOU MIGHT HAVE GUESSED , THE ORIGINAL SPRING AND SHOCK ABSORBER SETTINGS FOR THE CAR WERE BASED ON THE ORIGINAL SPEC TIRE , AND MANY OF US HAVE CHANGED EITHER SPRINGS OR SHOCK , OR BOTH. THE BEST SOLUTION IS TO EXPERIMENT WITH THE INFLATION UNTIL YOU FIND A COMBINATION THAT IS GOOD FOR YOU

KEN GILLANDERS - VOLUME 87 , JULY - AUGUST 1990

SUSPENSION MODIFICATIONS

NOW THAT PEOPLE CAN ORDER THE NYLATRON UPPER CONTROL ARM BUSHING KIT , SOME WORDS ON HOW TO INSTALL THEM.

WHEN DISMANTLING THE UPPER CONTRUL ARM BE SURE TO SUPPORT THE LOWER CONTROL ARM WITH A JACK. YES , I KNOW IT CAN'T GO ANYWHERE , BUT SOME OF THE CAR 'AVE LOST THEIR BUMP STOPS AND I WOULD FEEL BETTER IF EVERYONE WAS SAFE.

AFTER YOU PRESS THE NYLATRON BUSHING INTO PLACE IN THE UPPER CONTROL ARM YOU WILL BIND THAT THE .010 CLEARENCE BETWEEN THE STEEL BUSHING AND THE NYLATRON BUSH HAS SHRUNK ABOUR .001. BE SURE IT TURNS FREELY.

DON'T FORCE THE STEEL BUSHING ONTO THE SUSPENSION PIN , IT IS SUPPOSED TO FIT CLOSE BUT DON'T WAIL ON IT. A BRASS DRIFT AND A LIGHT HAMMER SHOULD DO THE TRICK ON EVEN THE MOST STUBBORN ONES.

AFTER INSTALLING THE KIT , BUT BEFORE BOLTING UP THE BALL JOINT , CHECK TO SEE THAT THE ARMS MOVE FREELY.

WHEN YOU RECONNECT THE BALL JOINT MAKE SURE IT IS VERTICLE IN RELATION TO THE ARM ASSEMBLY. THE SOCKET FOR IT IS SERRATED AND WILL AFFECT THE CASTOR IF INSTALLED INCORRECTLY. ALSO MAKE SURE THE BALL JOINT IS IN GOOD CONDITION

GOOD LUCK ! THIS IS A WORTHWILE MODIFICATION AND THE PRICE IS DEFINETELY WORTH IT THE CAR WILL HANDLE MORE POSITIVELY AND THE RIDE QUALITY IS NOT ADVERSELY AFFECTED.

UPPER CONTROL ARM BUSHINGS , PART 2

RECIENTLY I PUT NYLATRON UPPER CONTROL ARM BUSHINGS IN STU STERN'S TR3A . I NOTICED A PROBLEM THAT I HAD NOT ADDRESSED IN THE EARLER ARTICLE.

THE NYLATRON BUSHING THAT PRESSES INTO THE CONTROL ARM IS A PRECISION PIECE AND REQUIRES THE CORRECT AMOUNT OF CRUSH TO MAINTAIN THE CORRECT RUNNING CLEARENCE. THIS , OF COURSE , WILL TAKE CARE OF ITSELF IF THE INSIDE OF THE CONTROL ARM HOLE IS CLEAN AND RUST FREE. UNFORTUNATELY THEY SELDOM ARE.

THEREFORE , YOU SHOULD CONSIDER SCRAPING OUT ALL THE OLD RUBBER WITH A KNIFE . THEN USE A CYLINDER HONE TO CLEAN THE HOLE UNTIL YOU HAVE A BRIGHT AND RUST FREE SURFACE. ONE OF THE BEST AIDS FOR THE HONE IS TO SPRAY WD-40 IN THE HOLE WHILE YOU ARE HONNING IT.

BE SURE YOU CHECK TO SEE THAT THE METAL SLEEVE TURNS FREELY INSIDE THE INSTALLED BUSHING BEFORE YOU TRY TO PUT THE ASSEMBLY TOGETHER.

IN ADDITION ,, SOME CARS SUFFER FROM LACK OF SPACE BETWEEN THE END OF THE UPPER CONTROL ARM SHAT AND THE INNER FENDER WHICH CAN BE REMIDIED WITH A HAMMER AND A LONG PUNCH. IT IS NOT A BIG JOB BUT THE RESULTS ARE VERY GOOD AND THE FIX IS PERMANENT.

KEN GILLANDERS - VOLUME 42 , FEBRUARY 1986

TRIUMPH CURIOS

IF YOU HAVENT DUG DEEP INTO YOUR POCKETS YET FOR THE STEEL/NYLATRON UPPER "A" ARM BUSH SET (WHICH IS QUITE SUPERIOR), OR ALREADY HAVE THE STANDARD RUBBER ONES ON HAND TO INSTALL , HERE'S A TIP THAT MIGHT MAKE THE RUBBER ONES LAST LONGER

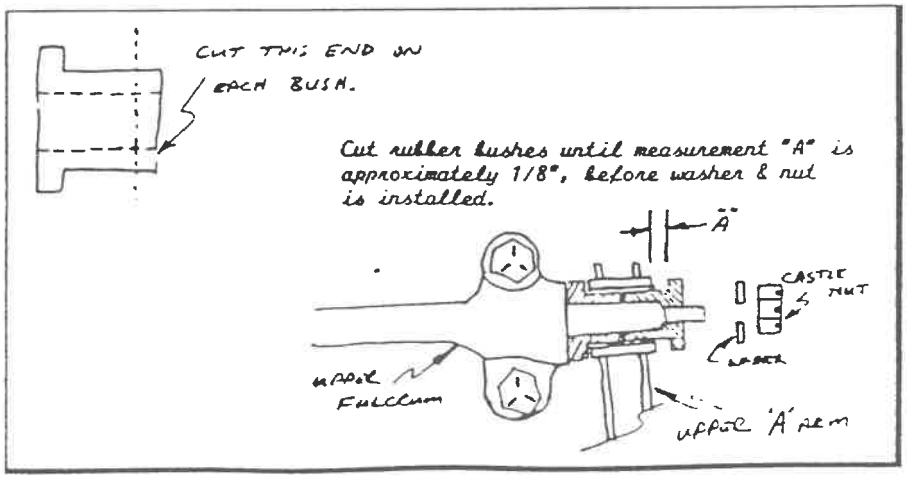
WHEN I REBUILT MY FRONT END AND IT CAME TIME TO PUT THESE IN , I NOTICES THAT WHEN PUSHED IN COMPLETELY THEY STICK OUT ABOUT 1/2 " AND WHEN THE WASHER AND CASTLE NUT WERE INSTALLED IT COMPRESSED THE RUBBER SEVERLY.

COUPLE THIS WITH SOMEONE UNKNOWINGLY LUBRICATING THE BUSHES WITH GREASE OR OIL , AND YOU WILL PROBABLY BE DOING THIS JOB AGAIN REAL SOON.

TO REMEDY THIS APPARENT PROBLEM I CUT A SMALL AMOUNT FROM EACH BUSH SO THAT WHEN INSTALLED , THEY STUCK OUT ONLY ABOUT 1/8" OR SO BEFORE INSTALLING THE WASHER AND NUT.

INSURE YOU DO NOT GET OIL OR GREASE ON THE BUSHES AS THIS WILL CAUSE RAPID WEAR. TIGHTEN THE CASTLE NUTS SNUGLY AND PIN , PRESTO !

JOHN COLE - VOLUME 59 , DECEMBER 1987



STEERING BOX ADJUSTMENT

At the last tech session, I was amazed to see how many of our members cars have steering boxes that are out of adjustment. Most of the cars I worked on and I think most of the cars that Steve Hedke worked on, ranged from the minor end play adjustmen to those that should have been dangerous to drive.

However, only the sector shaft end play is adjustable without dismantling the steering box. First, place the front end of the vehicle on stands at a comfortable height. On the top of the steering gear box is a 7/16" set screw running through a lock nut (5/8") and into the top of the steering gear box and i what controls the end play of the sector shaft. Have someone rock the steering wheel back and forth just far enough to move the front wheels a little each way and with the left front whee off you can watch the steering arm which is attached to the sector shaft at the bottom of the steering box move up and down

By loosening th lock nut the set screw can be wound into the steering gear box to remove the slack. The only caution is to remember that the tightest part of the steering geometry is at thecenter of the travel and too tight an adjustment will make i difficult to steer. It is generally best to tighten a little a a time and turn the steering side to side to check for binding.

One final word. It seems that very few bother to check the gea oil in the steering box and that can be both expensive and dangerous. The fill is a rubber plug pressed into the steering co umn about a foot above the steering box itself and a good gear oil SAE 80-90 will do fine. Remember that a steering box that doesn't leak oil is just empty.

Ken Gillanders
Newsletter #31

TR FRONT END PROBLEMS

With the return of reproduced upper ball joints to the various TR part suppliers we again have available all the pieces to rebuild the front end, both steering and suspension.

However, now is probably a pretty good time to look at the TR front end and some of the problems you can have. As castor and camber are locked into the design and cannot be adjusted, we are left with toe-in as the solely adjustable front end alignment dimension.

With the advent of 60 and 70 profile tires, a maladjusted toe-in can cause escessive wear on the inside or outside of the tread of the tire. Excessive wear on the outside of the tire can be excessive toe-in which scrubs off the outside tread area of the tire. Of course the reverse is true with excessive toe-out. Excessive slack in the steering can be traceable to the steering box or the silent block bushs. But don't overlook that it can also be traceable to worn or loose tie rod ends.

Worn or loose upper ball joints, lower trunions or inner control arm bushings can cause a general looseness in the steering or handling and can be very dangerous (three wheel Triumphs don't handle too well.)

Last, if your TR feels like it is floating in the front and lacks the precise handling it once had, don't overlook the shock absorbers. If you have 40,000 miles on the shocks and you are suspicious, have them checked.

Usually with a little care and occassional lubrication, the front suspension and steering will give you many miles of excellent service. The upper control arm inner bushings and the silent block bushs are the first things to go but inspect the rest of the front end anyway, it may save some expensive repairs later.

Ken Gillanders
Newsletter #30

FRONT WHEEL BEARINGS

It is truly amazing how long a tapered roller bearing will survive without any care. Unfortunately, there is a limit, and once you exceed it, failure of the bearing is inevitable. When the TR was designed, the front wheel bearings were designed for drum brakes and were marginal to begin with. Now add disc brakes, with their higher operating temperatures, about 10% more weight, old style low-temperature wheel bearing grease, and you have a recipe for early failure.

Based on the above, some maintenance is probably in order. To remove the rotor and gain access to the inner wheel bearing, it is first necessary to remove the brake caliper. Behind the caliper on the mounting ears are two 5/8" bolts holding it to the spindle upright, but before removing these bolts, back them out part way and check for any shims between the caliper and the mount. Note the location and number of shims, then pull the caliper out of the way. (carefully lean it against the coil spring tower... this will eliminate the need to disconnect the brake hose and bleed the brakes when you're done - ed.)

At this point, you can remove the rotor by removing the dust cap, spindle nut cotter pin, spindle nut, then, with a gentle pull, the rotor complete with bearings. Now, with a small drift, you should be able to reach through the rotor from the outer bearing cavity and punch out the inner bearing and retainer.

It is best to wash the bearings in either solvent or engine fuel to get out all the old grease. Now check the individual bearings and the races (which will still be in the rotor) for wear or other abnormal signs such as pitting or flaking of the surfaces. When you are ready to pack the bearings with grease, you should consider one of the new high-temp disc brake wheel bearing greases (molybdenum disulfide). Press the grease through the roller cage from the big end towards the small end.

It is now time to reassemble, in the reverse order. The bearing pre-load is probably best set by tightening the spindle nut to where it stops without forcing, then back up to the next notch where the cotter pin holes will line up. At this time you should be ready to re-mount the brake caliper, and by forcing the brake pads apart with a screwdriver the caliper will fit over the rotor. Be sure to put the shims back where they came from. You should now be ready for a road test and about 15 to 20,000 miles of trouble-free driving.

Don't attempt to re-use any bearing, bearing race or spindle that shows any sign of abnormal wear. REPLACE THEM.

Ken Gillanders
Newsletter #25

SHIMMY PROBLEMS

The old vintage Triumph seems to have its share of front end vibration, shimmy, and shaking, some of which is the original design, and some of which appears to be a lack of knowledge as to its cause. Those of us who have owned a shaker seem to go through the usual checklist of looking for loose tie rod ends, bad front end bushings, and worn ball joints, never finding the cause. Fortunately, the usual causes are no mystery; it is just that we have been looking in the wrong places. With the help of a technical paper from the D.O.T. on this problem, along with twenty-five years of personal experience, I have developed a checklist that might help.

WHEEL BALANCE. If you are going to have the wheels balanced dynamically (on the car), it will be necessary to mark the wheel and hub so that if the wheel is removed for some reason later on, you can replace it in exactly the same location and not disturb the balance. Usually, a center punch mark on the end of one wheel stud and another mark next to the corresponding stud hole on the wheel works fine. For wire wheels, mark the edge of the wheel hub, then make a matching mark on the edge of the wheel center. Generally, off-the-car balances do not work too well because they don't compensate for the weight of other rotating parts such as brake discs (or drums).

TIRE PRESSURES. Would you believe that the most common cause of shake and wobble is excessive tire pressure? All tires have a have a normal cushion effect as they are running down the road, which absorbs bumps and irregularities in the roadway up to its natural limit, without transferring them to the suspension. This limit is related directly to inflation pressure. Furthermore, the load and frequency of road deviationd transmitted to the suspension and shock absorbers varies with not only tire pressure, bt with tire design, size, and conditions which will be covered later. The most persistent shaker I ever saw was a TR-6 that we chased for two years, the problem turning out to be about 5 psi. too much air in the front tires, and shocks that were worn out. The Department of Transportation tests found that one model of Datsun was completely unmanageable when the front tires were inflated to 30 psi., but was perfectly normal at 28 psi.

TIRE OR WHEEL OUT OF ROUND. Sometimes a tire or wheel may be out of round, and this will create a shake that your suspension system cannot handle. Jack up the wheel in question and use a block under the wheel and tire which does not touch it, then spin the wheel and watch to see if the space between the block and the spinning tire changes, indicating a tire (or wheel) out of round. This is also a good time to check for a tire or wheel with a run-out problem. Position yourself in front of the wheel and see if it moves back and forth to the left or right as it spins. This indicates that there is run-out in the tire or wheel.

As the years go by, many of these variables change, such as the tires that are available, their road characteristics, the shocks available to us, and their capacity and valving. Fortunately, with a little experimentation, the problems that may come up can usually be overcome.

Ken Gillanders

SHAFT AND HUB REPAIR

This bit describes the results of an extended experiment with worn shafts, hubs, and bearing races. Several months ago my son's TR-6 developed a very loose front crankshaft hub, and when the worn part was removed, it was discovered that the nose of the crankshaft was worn under-size, apparently by the action of the hub working back and forth on it. Repairing the badly worn woodruff-key slot in the hub was no particular problem. We simply had it welded up, then reshaped it with a grinder and then finally, a file. However, the worn surface on the nose of the crankshaft was another matter. I had heard tell of a Loctite product specially developed to cure this problem, and a visit to their distributor revealed that a new product had indeed been created: Loctite "Quick Metal", and it had applications limited only by your imagination. After cleaning both surfaces with lacquer thinner, a thin coat of Quick Metal was put on the nose of the crankshaft, and the inner surface of the hub. After curing for about one hour, it has twice the strength of a press fit.

Later, on another car (an early TR-3) with a very loose inner wheel bearing race, it was discovered that the hub was worn and would no longer hold a race at all. We again used the Loctite Quick Metal and had a durable and permanent repair.

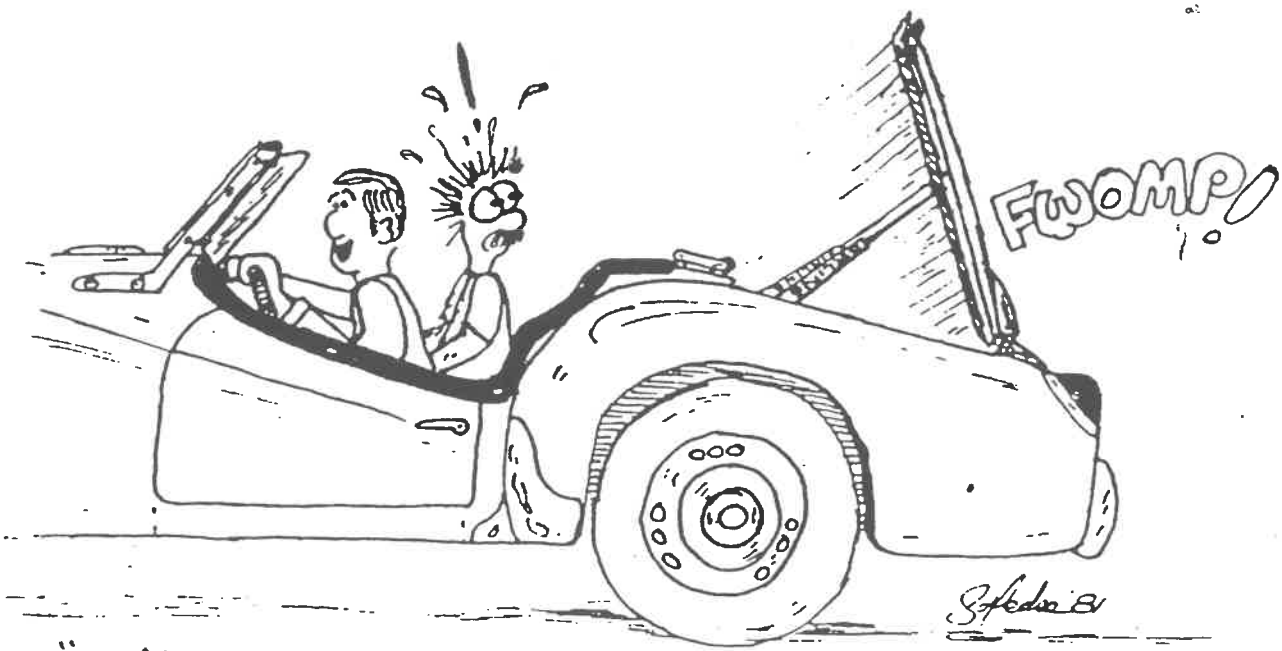
That's the good news. The bad news is that a tube of this stuff costs about $20.00. However, it will last for many uses and in a large number of different applications where shaft or hub wear has become a source of concern. Most of us with elderly English cars have become accustomed to bolts, nuts, and various other parts falling off, and this new product from Loctite joins their other proven items such as "Nut Lock" and "Stud Lock" in being valuable aids for the Triumph owner.

Ken Gillanders
Newsletter #17

FRONT END BUSHINGS

A very common question lately has been, is there a better solution to the rapidly detorating upper control arm bushings and the answer is aqualified, yes. The problem is that the upper control arm bushings are rubber and crack and wear as rubber always does. One solution is to make replacement bushings from Teflon or some other like plastic. However, thebushings from the inner end of the lower control arm will fit on the inner end of the top control arm, they are an exact replacement and are a metal bushing inside with a plastic sleeve between the arm and the metal sleeve. They make the front end slightly more stiff but not so that you would really notice and they last almost forever. Generally a good solution to a troublesome problem.

Ken Gillanders
Unpublished as of this printing



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CLUTCH SLAVE CYLINDER RETURN SPRING.

First, a common misunderstanding is over the clutch slave cylinder return spring. I have seen about every possible spring substituted for the factory spring. However, the factory spring is designed with the correct tension load and tension gain to over come the natural resistance of returning the clutch release bearing beyond the reach of the clutch plate fingers and is additionally designed to return the hydraulic system to a position of rest. DO NOT SUBSTITUTE for the factory spring. It can be recognized by the design of one end, which is square rather than a smooth open hook.

TR FRONT END PROBLEMS.

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Last, if your TR feels like it is floating in the front and lacks the precise handling it once had, don't overlook the shock absorbers. If you have 40,000 miles on the shocks and you are suspicious, have them checked.

Usually with a little care and occassional lubrication, the front suspension and steering will give you many miles of excellent service. The upper control arm inner bushings and the silent-bloc bushes are the first things to go but inspect the rest of the front end anyway, it may save some expensive repairs later.

Ed.note.....
Something that even most of the experts don't get right in relation to the TR front-end is the lubrication of the trunions.Most times they are greased along with the rest of the car.In fact they should be oiled & to that end should have a plug fitted whereas,most times,this has been replaced with a grease nipple.The Factory reccommended 1000 miles between oilings.I have found that a good compromise is engine oil into which has been mixed a tube of'Molybond' Molebdenum-disulphide engine additive. The grease nipple should be changed for a plug after oiling.There are often small grease/oil guns available at swap meets and the purchase of one would be a wise move if you do your own servicing.

Works for me.mm.

FALSE ECONOMY

It always seems so obvious after the event. At least that's what often happens to me. I have never been particularly happy with the front brakes on my TR2. The rear brakes were another story (ask Alan Mitchell !!) but that problem originated because I reversed the positions of the two tension springs.

To return to the front brakes - they were randomly pulling to the left. Sometimes slightly, sometimes severely and at other times, not at all. Wheel cylinders were brand new and adjustment was repeatedly carried out but to no avail. I took the car recently to a 'high-tech' brake testing service. Very interesting gadget (details later). Told the operator about the problem and the first test revealed a major difference between left front and right front - some 99% !

However the subsequent 3 test stops were perfect showing little difference between left and right. What slight difference there was favoured increased braking on the left front and the first test had shown practically no braking effort on the right front.

The only part of the front braking system that was not new was the flexible hose on the right side. Yes ... I know you anticipated that solution all the time, and ... how could I be so stupid? The trouble with a restoration is that it becomes a bottomless pit into which more and more money can be thrown. So I thought I would save some money by using what I took to be a good second hand hose.

And that was the problem. When I removed the hose and attempted to blow through it ..... it was completely blocked! Compressed air would just force a passage through it. I sectioned the hose out of curiosity and found that it was intact and in good condition for all but 2mm of its length. Just *near* the crimped end the internal diameter had reduced to practically nothing although strangely enough the area of maximum crimp was quite clear.

Anyway, it was *false economy* not to replace all such hoses as a matter of course.

....continued next page, lower.....

This article was extracted from the Magazine of the TR Register of S.California. Again, our thanks. mm.

The Great Alfin Brake Drum Caper

Story & photos by Jon Korbin

After a lot of thought, and the almost uncontrollable desire to do something to improve the look of their cars, Mr. Korbin and Mr. McIlhaney decided that they badly needed some finned aluminum brake drums for their TR's (beside the fact that Mr. Bob Youngdahl had just found some of these drums at the Pick-Your-Part junkyard). The search now began!

After two days at Pick-Your-Part, we had gathered nine Datsun 2 aluminum brake drums, six of which had enough "meat" on them so that they could be `turned' and used in our Triumphs. To buy these drums new would have cost around $80.00 apiece... the used ones we bought cost $20.00 per pair.

After reading Mr. Gillanders article about the "little bit of machine work" needed to adapt the drums to the TR, we felt sure that we would only have to enlarge the center hole slightly to fit over the hub. Were we ever mistaken!

The Datsun brake drum is different from the TR in that there is a groove around the rear edge which has to ride over the flange on the TR rear brake backing plate. We discovered that this groove was not going to clear the flange because it was too narrow. After calling Mr. Gillanders to discuss this "slight complication" we were informed that, "No, you didn't buy the wrong drums... they do need some other alterations." After hearing this, we decided to try and do the additional machining ourselves, and set out with a router and a carbide-tipped cutter to widen and deepen the groove in the Datsun brake drum.

Many cutting tips later, we completed the job on four of the drums, but then discovered that they still wouldn't fit flush against the hub - it turns out that the four wheel studs widen slightly at their base, where there aren't any threads. To solve this problem, we used a die-grinder and stone to bevel the inside of the four holes in the brake drum slightly. The next step was to mark and drill the two small holes for the setscrews in each drum, then countersinking the holes so that the screws would fit flush as they do in the TR drum. This was also accomplished with the die-grinder and stone.

Finally we had the drums turned professionally, then painted them and mounted them on our cars. Here we discovered that the extra thickness of these aluminum drums prevented the two short setscrews from threading into the hub, so they will have to be replaced with longer screws. Finally, the wheels were mounted, and the cars given an extensive road test while we looked and listened for any signs of trouble. Both cars behaved in a perfectly normal manner, with no problems.

We'll let you know how this works out as we put some more mileage on these new drums. All in all, a somewhat difficult task, but we were rewarded with beautiful results!

23/3/93

Observations of an itinerant mechanic

Due to the hygroscopic nature of brake fluid and the often extended periods of time between use it is common for brake (and clutch) slave cylinder pistons of older cars to 'lock up' with rust, either stop operating altogether or suffer a substantial loss in efficiency.

Symptoms are usually a tendency for the vehicle to 'pull' to one side and/or the need for higher pedal pressure. A wheel can also totally or partially lock up if the slave cylinder piston fails to retract because of accumulated rust compacting between piston and cylinder wall.

A fairly common problem found with the Lockheed and Girling rear drum brake systems is that the bottom piston in the slave cylinder will cease to operate but tends to go unnoticed because the top piston is still operated by the handbrake; the assumption is made (incorrectly) that as the handrake works on the slave cylinder so does the hydraulics.

To create a braking system that will combine minimum maintenance with maximum efficiency and safety the bores of ALL brake cylinders should be lined with a high grade stainless steel AND ALSO the respective pistons should be either electroplated or also made in stainless steel; a corroding piston can still freeze inside a non corroding cylinder.

Use of silicone brake fluid

If converting to silicone brake fluid it is important that there be no old brake fluid; hence residual moisture; left in the system. The reason for this precaution is because silicone brake fluid does not absorb moisture and if traces of moisture find their way into wheel slave cylinders it is possible that enough heat may be generated during brake operation to turn the water to steam - TOTAL AND INSTANT BRAKE FAILURE! So all flexible hydraulic lines as well as other 'rubber' components are usually replaced on conversion.

Apart from the above provisos it would appear that silicone brake fluid provides an excellent (if expensive) basis for a minimum maintenance braking system.

FRONT WHEEL BEARINGS

It is truly amazing how long a tapered roller bearing will survive without any care. Unfortunately, there is a limit, and once you exceed it, failure of the bearing is inevitable. When the TR was designed, the front wheel bearings were designed for drum brakes and were marginal to begin with. Now add disc brakes, with their higher operating temperatures, about 10% more weight, old style low-temperature wheel bearing grease, and you have a recipe for early failure.

Based on the above, some maintenance is probably in order. To remove the rotor and gain access to the inner wheel bearing, it is first necessary to remove the brake caliper. Behind the caliper on the mounting ears are two 5/8" bolts holding it to the spindle upright, but before removing these bolts, back them out part way and check for any shims between the caliper and the mount. Note the location and number of shims, then pull the caliper out of the way. (Carefully lean it against the coil spring tower... this will eliminate the need to disconnect the brake hose and bleed the brakes when you're done - ed.)

At this point, you can remove the rotor by removing the dust cap, spindle nut cotter pin, spindle nut, then, with a gentle pull, the rotor complete with bearings. Now, with a small drift, you should be able to reach through the rotor from the outer bearing cavity and punch out the inner bearing and retainer.

It is best to wash the bearings in either solvent or engine fuel to get out all the old grease. Now check the individual bearings and the races (which will still be in the rotor) for wear or other abnormal signs such as pitting or flaking of the surfaces. When you are ready to pack the bearings with grease, you should consider one of the new high-temp disc brake wheel bearing greases (molybdenum disulfide). Press the grease through the roller cage from the big end towards the small end.

It is now time to reassemble, in the reverse order. The bearing pre-load is probably best set by tightening the spindle nut to where it stops without forcing, then back up to the next notch where the cotter pin holes will line up. At this time you should be ready to re-mount the brake caliper, and by forcing the brake pads apart with a screwdriver the caliper will fit over the rotor. Be sure to put the shims back where they came from. You should now be ready for a road test and about 15 to 20,000 miles of trouble-free driving.

Don't attempt to re-use any bearing, bearing race or spindle that shows any sign of abnormal wear. REPLACE THEM.

16.

TR 2-3-3A BRAKES

I cannot understand why Triumph spent so much time "stuffing around" with the TR braking system. The following table attempts to correlate the ins and out of the system.

Because of the extra foot pressure needed to make disc brakes function effectively, the imbalance of disc pressure in front compared with pressure applied to rear drum brakes created the situation where rear wheel lock-up occurred. Hence the constant changing of rear wheel units, shoes and drums in the life of the TR's.

BRAKE BOOSTERS

Any brake booster fitted to an all drum system does not have much extra braking effect. The main difference is the reduced pedal pressure required to achieve the same braking.

On the other hand, disc brakes need the extra pressure as supplied by a booster to operate effectively. Not only is pedal pressure reduced but braking ability is ***increased***. Therefore, it stands to reason that boosted brakes on a disc brake / drum brake combination have a greater advantage in enabling the "braking balance" to be achieved.

TESTING AND RESULTS

The consequence of boosting TR brakes has been proven to be most effective by drivers who have fitted same to their vehicles. The writer has tried various combinations of front disc to rear drum and rear unit shoe bore size and without question the best result has been with 10" rear drums and a rear unit bore of 0.75". I have stood on the pedal in a supposed "emergency stop" situation from various speeds ranging from 30 mph to 110 mph. The braking is efficient and beautifully progressive with no sign of rear wheel lock-up and the vehicle stopping ***in a straight line***.

BOOSTER FITTING

When fitting a booster to disc brake TR's (The unit to use is the PBR VH 44) make sure that your front brake hoses are in top order and there is no accumulated sludge in the caliper bores. A good idea is to have all brake pads at around a minimum of 50%. This is to make sure that all four caliper cups work evenly and so obviate drag or pull to one side.

Because of the inherent "servo" action created by the leading shoe in any drum brake situation there is a tendency for brake "grabbing" when the unit is cold. The majority of brake lining materials are adversely affected by heat. The coefficient of friction is reduced as the lining becomes hotter. All types of leading shoe brakes require a very light pedal pressure for a given retarding effect but are very susceptible to temperature. However, trailing shoes are virtually insensitive to temperature effects, but need a higher pedal pressure. Of course, all the above does not apply to disc brakes. It is important however, for the restrictor valve in the TR brake system to be in good working order so that the pads are kept in gentle contact with the disc at all times for two reasons:-

(1) To wipe the disc clean from moisture and / or road dust;
(2) To keep the distance between the pad and the disc at a minimum to ensure an instant braking response to pedal action.

Fading of disc brakes does not occur as the expansion of the pad and the disc itself, when hot, brings pad and disc closer together.

THE BUSH MECHANIC

The Bush Mechanic,it turns out,is no other than that well-known punter of very fast TRs & Vanguard Sportsmen,Sir Jack Evans of Armidale,NSW.Jack spent over 4 months accumulating the data contained within this article & attendant Table.Our thanks,Jack,& we ask that our TR friends around the world attribute the item if they re-publish.

99

mm.

TR2 - 3 - 3A "BRAKE DOWN"

)DEL	COMMISSION NOS	FRONT BRAKES	TYPE	BORE	REAR (DRUM ALL MODELS)	BORE	MAKE	COMMENTS
R2	TS1-TS5481	10"x2 1/4"	DRUM	15/16"	9" X 1 3/4"	0.875"	LOCKHEED	Prototype TR2's had 9" drums all round. Unexpected performance necessitated change to 10" front drum.
R2	TS5482-TS8636	10" X 2 1/4"	DRUM	15/16"	10" X 2 1/4"	0.875"	LOCKHEED	Rear drums upgraded to 10". Commission numbers here are different from accepted figures. Research has shown that these commission numbers are correct - Triumph Parts Book (4th Edition) is incorrect.
R3	T58637-TS13045	10" X 2 1/4"	DRUM	15/16"	10" X 2 1/4"	0.875"	LOCKHEED	Change over to TR3 remained same set-up.
R3	TS13046-TS15331	11"	DISC "A TYPE" CALIPER	2 1/8"	10" X 2 1/4"	0.75"	GIRLING	First production car in world to have disc brakes fitted. Flat piston head in rear units.
R3	TS15332-TS22013	11"	DISC "A TYPE" CALIPER	2 1/8"	10" X 2 1/4"	0.75"	GIRLING	Rear pistons changed to slotted type.
R3A	TS22014-TS34403	11"	DISC "A TYPE" CALIPER	2 1/8"	10" X 2 1/4"	0.75"	GIRLING	Initial TR3A's carried on with similar set-up to late TR3's.
TR3A	TS33894-TS34403 510 Vehicles in all	11"	DISC "A TYPE" CALIPER	2 1/8"	10" X 2 1/4"	0.75" or 0.625"	GIRLING	Haphazard installation of rear unit bore size. This was a further attempt to cure rear wheel lock-up.
TR3A	TS34404-TS56376	11"	DISC "A TYPE" CALIPER	2 1/8"	10" X 2 1/4"	0.625"	GIRLING	Settled on smaller rear unit bore. Results still not completely satisfactory.
TR3A	TS-56377-TS82346(?)	11"	DISC "B TYPE" CALIPER	2 1/8"	9" X 1 3/4"	0.75"	GIRLING	Rear drums changed back to original TR2 drums with original unit bore size. This combination proved reasonably satisfactory and more or less remained until the end of TR3A production in 1962.

.B. Some very late TR3A's kept the 9" rear drums, but with reduced rear unit bore size ie 0.70". Apparently this was the beginning of the new TR4 braking system. At the same time, the front disc diameter was reduced to 10 3/4". Slightly reduced front braking ability necessitated the corresponding rear unit bore reduction.

20.

VERTICAL LINK BLUES

Sadly, my topless motoring days are over for a while as the TR4 embarrassed me recently by snapping a vertical link on the near side suspension assembly. As Bill Piggott mentions in his highly recommended book "Original Triumph TR", the vertical link and trunnion assembly is the front suspensions Achilles Heel on all TR's.

I was travelling at 40 MPH at the time, stuck behind an old fellow wearing a hat who was driving a Mazda or Toyota of some description. I was tempted to throw the overdrive out and blast past him but decided to wait for a straight stretch of road that was a mile or so ahead. Without any pre-warning the front left hand side of the TR dropped, giving all the indications of a puncture. I immediately put the left hand blinker on and steered the car off of the road as there were vehicles behind me. The car then wanted to keep on steering to the left as the front left hand wheel had by now wedged itself into the wheel arch and the natural position it assumed was causing it to steer to the left. Some judicious braking and hefty steering brought the car to a stop inches away from a roadside guide post and a couple of feet away from disappearing down a rather deep embankment.

Still expecting to see a puncture in the nearside tyre, I was puzzled to see all four tyres inflated but the left hand front of the car resting on the chassis. I now realised something more serious had occurred and deduced that the suspension had collapsed. In the fickle Tasmanian weather I waited for a tow truck to arrive. It rained then proceeded to hail on me while I waited. The weather man must have decided mechanical damage wasn't enough, I needed to be humiliated in to the bargain.

Upon getting the car home I discovered the extent of the damage. The vertical link had sheared off at the junction of the threaded section on the lower part. This caused the suspension to collapse and the wheel to lodge in the wheel arch. Fortunately no panel damage occurred and more importantly no one was injured.

I've decided to replace both links and trunnion assemblies and was fortunate enough to be able to contact Alan Donohue, who is currently in England on a shopping spree. He has purchased the appropriate parts for me and is shipping them back. A full set of seals and bushes is also going to be fitted in the front as well as the rear. New front dampers have been purchased and the rear lever action dampers will be overhauled. Springs will be re-tensioned and fitted with new collars.

I urge all TR owners to be aware of the vulnerability of these assemblies. My car is 32 years old and I reckon these are the original links and trunnions so I guess the use by date has finally arrived. It's frightening to think back on the speeds I've been travelling at in the TR with this faulty suspension and maybe I was lucky in the sense that the failure didn't occur whilst travelling at 80 MPH.

bob sTRachan

The article above is reprinted from TRACTION, the journal of the Victorian TSOA. Our thanks. The salutary lesson contained within has prompted your scribe to initiate an investigation regarding the possible remake, rebuild or total rethink regarding Vertical Links. If you have any thoughts regarding same will you please write to us giving details & suggestions. Darcie is looking at the feasa-bility of some kind of lower-link remake.....PLEASE give us your input as this problem is going to affect us all.. mm.

18. RACK & PINION STEERING CONVERSION.

The amazing thing is that we publish an article on some subject & the next thing you know everyone comes out of the woodwork with variations on the theme. Boyce Beeton is so entranced with the idea of Rack & Pinion steering that he wants to hear from anyone else that has done "IT". Boyce has already converted the farm tractor, two Isetta Bubble Cars & his wifes' Celica. That made her cross because it already had R&P steering. ANYWAY...Please write to Boyce with your story.

Brett Boughton from Western Australia writes.....

Firstly, I must point out that had a serviceable right hand box been available for my American car at reasonable cost, then I would not have pursued the conversion. However, after owning several early TRs, the converted car offers delightfully improved smoothness and directness of steering.

I read with interest Bob Schaller's experience and was not too surprised to find that we had independently arrived at similar designs. (There is only so much space available!)

In comparison my mod. allowed the standard crank pulley and fan to go unchanged and no welding of tie rod ends. Furthermore, one must note the need to keep the tie rod length and attitude as close as possible to original TR specs. as any appreciable deviation in geometry may cause "bump steer" (Thats "bump" and not "bum"). To that end, simply shortening a TR4 rack and tie rods is not the way to go.

With this important dimension in mind (second only to price) I went hunting for a suitable rack. As luck would have it my brother was visiting in his 1975 Ford Escort - the distance between rack balls was within 10mm of the TR's. Other features were of note -

a) The rack has 3 1/2 turns lock to lock
b) Neat construction and mounting
c) Sufficient arm length for rethreading, and
d) Good availability. As a guide I paid $90 for a second handy from the wreckers.

Needless to say the steering is light and smooth. I don't find the steering too slow, however this may be a matter of taste. For those who desire a quicker rack I believe that a rally rack could be obtained for the escorts. I haven't explored this option - I suspect that such a part would be more expensive than a rebuilt RHD cam and lever box.

In conclusion, I found that the conversion was relatively straight forward requiring $150 and three solid days. I must state that work was made easier as I had the body off at the time. I would suggest that such a conversion should only be attempted if you are contemplating a major car rebuild or, like me, you are stuck for a steering box.

Please note that the attached order of operations and sketches were written some 12 months after the actual modification and hence my ideas should be checked prior to major expenditure of money and effort.

Feel free to contact me if any point requires further clarification or advice...c/-56 Marsh Crt. Jarradale. WA. 6203.

TR3A RACK CONVERSION 1993
ORDER OF OPERATIONS

19.

1 Remove front apron and radiator

2 Remove front engine mounts - chock engine

3 Remove standard steering assembly - leaving steering arms on wheels

4 Buy 1975 Ford Escort rack - include mounting rubber (important) and dust boots - $100 good second hand

5 Dock and thread rack tie rods (see diagram)

6 Fabricate rack stanchiions (see diagram)

7 Bolt rack to stanchions for trial fitting (use Escort mounting rubber)

8 Adjust chassis X-member cut out in stanchions so that -
a) the rack tube passes 15mm below the standard TR fan extension and that the rack is halfway between the crank pulley and fan
b) the universal joint on the rack clears the engine mount

9 Note that the stanchions should fit neatly between your suspension towers - grind off chassis paint to allow for comprehensive gas weld of stanchion to chassis (tack and try first)

10 Machine tie rod joiners (see diagram) - use standard width lock nuts and assemble

11 Trial whole assembly (tack welded) from lock to lock whilst on the jack

12 You may have to trim the corners off your engine mounts

13 Remove rack - fully weld in stancions (you are almost there)

14 Re-assemble steering rack and rods

15 Fit late model Triumph double universal joint lower steering column - the spline should fit the Escort rack! Alas! note the shortfall to standard upper TR column and dissimilar spline

16 Dissassemble upper column - turn and mig weld a joiner incorporating late model Triumph spline - turn joiner after welding as this can act as a bearing surface for a "lubron" bush fitted into the end of the column

17 You will note that -
a) The welded joiner is hidden in the upper column
b) standard upper column mounts are retained
c) remote horn and blinker wiring is required
d) a composite or "dog legged" bottom radiator hose is required to clear the nearside stanchion (try Holden hoses first)

18 Adjust front suspension for toe-in and re-align steering wheel

[illegible] Good luck.

EDITORS NOTE. Brett forwarded 2 drawings with this article that would not have reproduced very well with our printing regime. We can send you a photocopy if you are planning this work or you can talk to Brett direct. Send a S.A.E. mm.

MORE ON RACK & PINION STEERING.

The article last issue about conversion to Rack & Pinion steering has prompted South Australian Member,Karl Zalk to write with the following information regarding the conversion that he has done to his TR3a.He says that the improvement to the driveability of the car is outstanding & cites light,precise,whiplash-free steering as contributing to make a good car great.The main thrust of his letter is re-produced here,along with his directions & drawings for duplicating his modification should this appeal to you.Karl is currently in the process of re-building a 1930 Triumph Super Seven Roadster & wants to know whether this is the original Side-Screen Triumph ?

Should you have any further need of information,we are sure that Karl would not mind you contacting him direct.Write him at his home..... 45 Miller St.,Springton.S.A. 5235.Karl has also suggested the Barossa Valley,north of Adelaide,as the venue for the next Concours, so what about a few of you who live near Adelaide getting together & putting a proposal forward for the Committee to consider.

.....care must be taken not to alter the basic steering geometry or excessive bump steer & incorrect wheel angles will resu-n 'squeal' & scrubbing of tyres,especially during cornering.

The length of the rack must position the ball joints in the same position as on the original central tie rod,but about 15mm. rearwards as it originally moves in an arc.A search of the wrecking yards for a suitable rack was to no avail but investigation showed that the TR4 rack was nearest to the requirements.Even so,this rack needs to be shortened 100mm.This can be done by removing that length from the left side of the rack.(Right side,if you are working on a Left-hand Drive car).Some machining work is required & a lathe is necessary.

Shortening of the outer tube is very simple.Remove Bronze bush from L.H.end,cut off 100 mm.& replace the bronze bush.

The rack itself is modified as per the drawings & any competant engineer should have little trouble in making the required changes.

The re-assembled rack is bolted to the chassis using a 50X25mm channel with suitable plates.It is held in position using TR4/Spitfire bushes & clamps.

The steering column lower half,consisting of universal joint at bottom & flexible upper joint was from a Triumph sedan or Stag. The upper steering column was from a Spitfire & the only part requiring fabricationwas the outer upper steering column-tube fitted with nylon bushes.This was clamped in position to underdash brackets & firewall.All steering components required no modification to either length or splined fittings;they just bolt together,an important safety consideration.

The front engine plate requires notching to clear the steering shaft.The standardfan clears the rack & because of the space vacated by the steering box,a wider radiator can be fitted if you wish.

Some purists will consider the modifications detailed here a sacrilege, but I believe that I now enjoy a safer & more responsive car.The lack of a solid steering column sitting there waiting to impale me in the event of a major frontal collision is a great plus, as is the greater ease of servicing.The car steers more precisely & the effort required at low speeds & parking is greatly reduced.

pp Karl Zalk

The information contained above is for the interest of our members and not to be taken as a reccomendation to undertake similar work. Should you decide to make any alterations to your vehicle,it is incumbent upon you to ensure that all relevant legal requirements are obeyed & to satisfy yourself of the safety of same.

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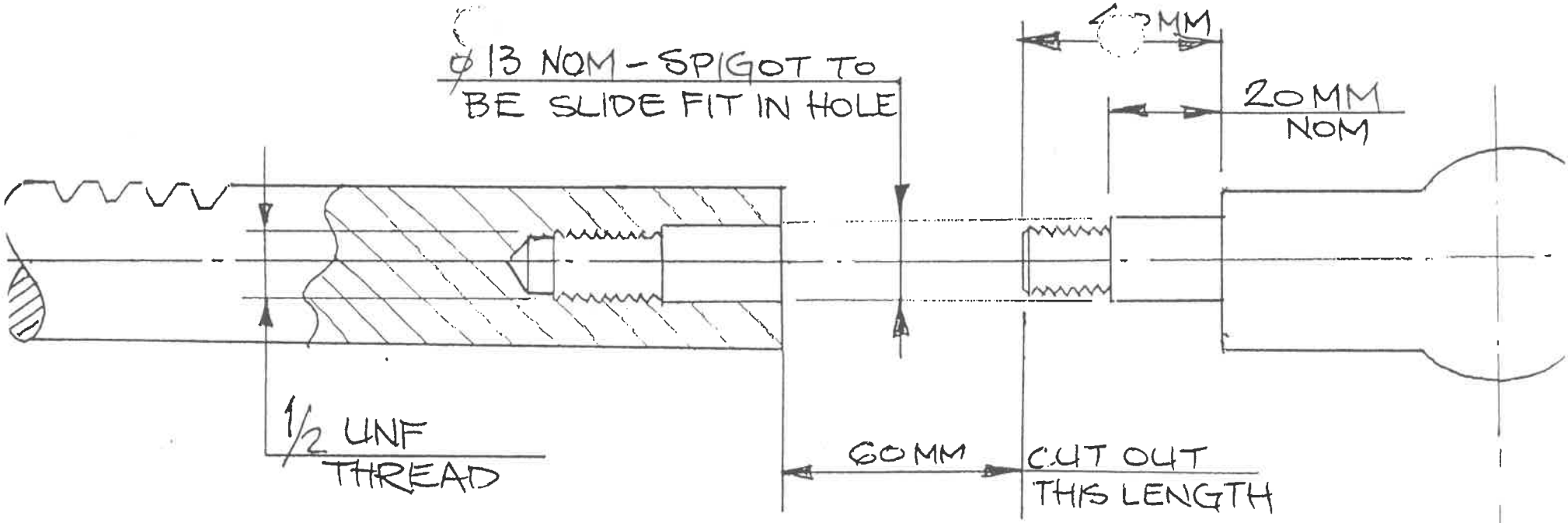

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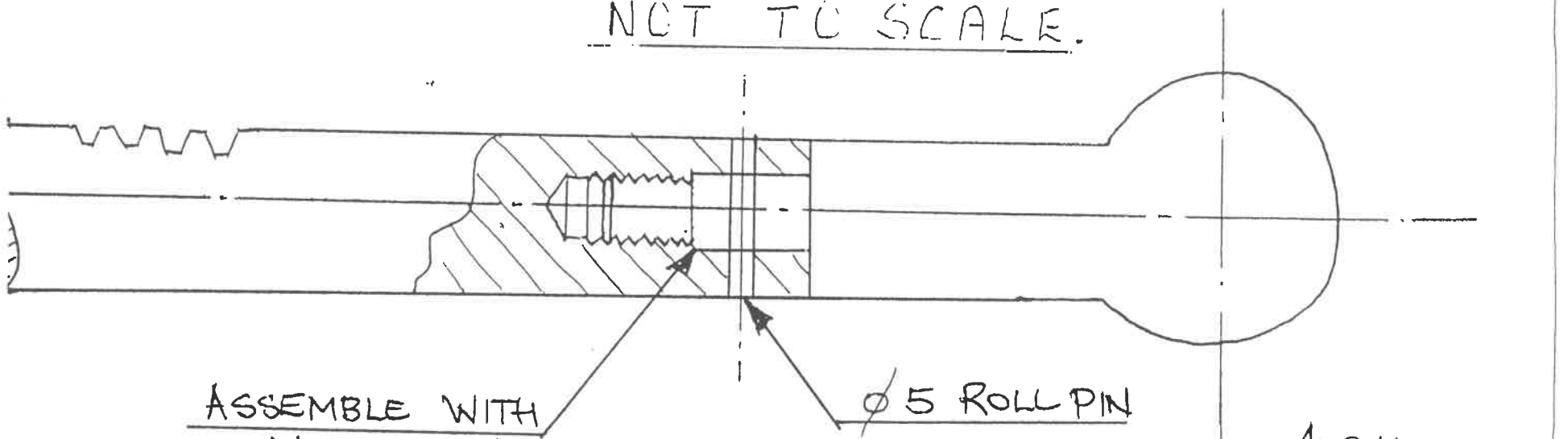


STEERING LEFT END OF TR4 RACK

13.

23/11/93

OBSERVATIONS OF AN ITINERANT MECHANIC

Engine Oil Leaks and TR's

As any TR owner knows there is something very STRANGE about a TR engine that doesn't leak oil - it usually means there isn't any in the engine anyway! There have also been rumours that a certain oil company convinced Triumph designers that an ongoing supply of oil to a vehicles underside prevented corrosion (correct) and the regular infusion of fresh oil into the engine extended oil change intervals (also correct); a side benefit was the automatic lubrication of exposed linkages.

The notion of chassis protection by oil diffusion was adopted by many English motor vehicle manufacturers and the effectiveness of this great design feature is attested by the large number of old English motor vehicle chassis surviving to this day.

However, back to TR's and for the interest of those of you who might (for whatever reason) wish to remove or reduce the special feature mentioned above.

The main sources of engine oil leaks in the TR are the sump and the rocker cover seals with minor leaks from the coil bracket and generator mounting bracket mounting bolts; the fuel pump gasket; the fuel pump priming lever pivot and the front and rear crankshaft seals. The most common offender is the sump seal and leaks here are usually due to a distorted sump flange caused by overtightening of the sump bolts which 'dishes' the sump metal around the bolt hole and causes the cork compound gasket to extrude and crack. The flange distortion can usually be corrected by the careful use of a suitable dolly and hammer (sump off) and checking with a straightedge; the gasket must be of a reasonably thick material NOT PAPER and is usually cork or cork neoprene.

I have been cutting my own sump gaskets lately and have found an excellent and inexpensive material called 'Klinger Statite' at my local supply shop. This material is 1.6mm thick and for about $3.00 you get enough to cut 2 sump gaskets; I usually use both as the material is readily compressible and the extra thickness is good insurance; tighten bolts 16 - 18 ft/lb and check tightness after a good run - more next newsletter. D.R.

RACK & PINION STEERING

The biggest single change that can to done to the TR2/3 to improve drivability is to do what Triumph should have done in the first place. Reasoning for the original steering box escapes us since the technology was in place as far back as 1950 (TCMG) and their object of competition was MGs anyway (public statement by John Black). Dealers lost sales in 1956-57 to MGA's because of the steering differences. Triumph only woke up with the advent of the TR4 in 1961.

To convert a TR3 requires some fabrication so, through not a "bolt-on" change, the end result is well worth the time, sweat, and expense. Also the installation is neat and appears to "belong there". The handling improvements are nothing short of fantastic.

Some minor disadvantages result: You do lose the turn signal in the steering wheel center (which is inconvenient anyway requiring removing your hand from the wheel). We substituted a Spitfire switch, mounted to the lower edge of the dash panel just inside the left rim of the wheel. Otherwise the upper TR3 column and wheel is used. It is not necessary to remove the original brackets either box mounting or idler arm.

New Parts needed:

1.	Rack & Pinion unit	TR4 or Spitfire
2.	Lower Universal Joint	#145377
3.	Upper Flex Joint	#130044
4.	Shafts (TR6 lower—will provide both lower shafts.)	#213308
5.	(2) Rack to bracket rubber units	#139386
6.	(2) Hold down U brackets	#156024

FABRICATION

Main Brackets:

3" channel iron

(2) 5/8" thick 6061-T6 Al plate spacers

Spacers are required to solidly mount the channel iron to the inside of the frame. One of the existing bumper bracket bolt holes is used, but a second hole must be drilled in the frame. The bracket, by notching, and then welding the joint shut provides a very strong mounting surface for the rack. The left bead needs to be notched out to clear the lower housing on the rack unit where the pinion housing extends below the rack center line.

The tie rods must be shortened 2" to accomodate the track dimensions difference. To get proper thread length it is necessary to build up the shaft diameter by welding, then turning to the major diameter for 1/2-20UNF thread.

Column: Attach the U-Joint (#145377) to the rack shaft.

The Upper Column:

Upper column housing should be nylon bushed, both upper and lower ends. The lower end of the hollow column ream to .5 inches. Diameter from about 4-5 inches up from lower end. File or grind the spline to provide flat surface for 1/4 bolt leads. Drill 2 clean, close spaced holes through.

Cut off flanged end of TR6 lower shaft and turn diameter for near drive fit into lower end of upper shaft. Match drill through the 1/4 diameter holes with 1/4-28UNF tap drill and thread. Clamp with 2, 1/4-28UNF grade 8 bolts.

Bolt Flex Joint (#130044) to flange.

Using the cutoff end of the spline of the TR6 lower shaft, inserted into the U Joint determine the length required to meet with the flex joint. Cut to length and fabricate a flange to install on the column. Now you have the lower column. The accompying photos illustrates this procedure.

"....it is well worth the time, sweat, and expense."

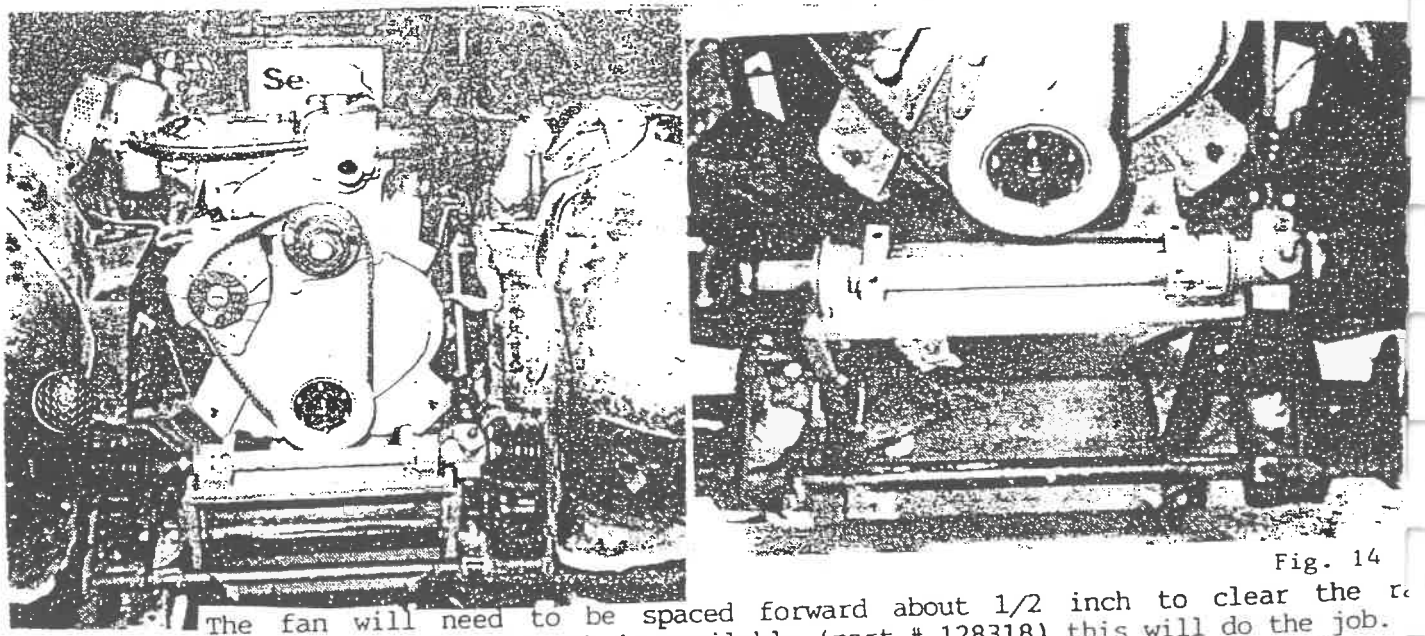


Fig. 14

The fan will need to be spaced forward about 1/2 inch to clear the r
However, if a TR4 fan hub is available (part # 128318) this will do the job.

The lower end of the upper column must be secured to the firewall wi
bracket (part# 607433). The bracket was standard on all TR3's with the "sp
steering column.

If you are working with the solid (early) column it must be converted to a s
upper configuration. Otherwise the procedure outlined is the same.

BOB SCHALLÉ

PART 4

TRANSMISSION
&
REAR END

OVERDRIVES

WE HAVE NOTICED , AS OF LATE , THAT MANY OF THE TECH ARTICLES APPEARING IN THE PUBLICATIONS OF OTHER CLUBS AND WIRTTEN ON THE EARLY TR'S CONTAIN ERRONIOUS OR INCOMPLETE INFORMATION. BEFORE YOU JUMP TO ANY CONCLUSIONS ABOUT ANY OF THIS MATERIAL YOU CHOULD CHECK IT OUT WITH STEVE HEDKE , MARTY LODAWER OR MYSELF , AS IT MAY SAVE SOME UNNECESSARY WORK OR CHANGES

WHILE ON THE SUBJECT , ALLAN LOGSDON GAVE ME A COPY OF AN ARTICLE PRINTED IN THE AUSTIN-HEALY CLUB NEWSLETTER , ABOUT THE ELECTRIC OVERDRIVE FITTED TO BOTH TR'S AND HEALEY'S. IN THE ARTICLE WAS A WARNING NOT TO USE HYPOID GEAR OIL IN THE OVERDRIVE UNITS. THE WARNING WAS STATED TO HAVE COME FROM THE MANUFACTURER AND IS IN DIRECT CONTRAST TO THE TR OWNERS HANDBOOK , WHICH SPECIFIES 80/90 GEAR OIL FOR THE SAME UNIT. OBVIOUSLY I COULDN'T LET THIS SITUATION REST AND I CALLED ENGLAND TO HAVE A CONTACT THERE CHECN IT OUT WITH THE MANUFACTURER.

THE STORY , AS RELATED TO ME , IS THAT THE AUSTIN HEALEY NEWSLETTER IS CORRECT AND THE MANUFACTURER OF THE ELECTRIC OVERDRIVE ASSEMBLY RECOMMENTS ONLY MOTOR OIL , NOT HEAVER THAN 50 WEIGHT AND NEVER GEAR OIL. I WAS ADVISED THAT TRIUMPH RECOMMENDED THE SAME LUBRICANT THOUGH 1960 BUT THAT THEY HAD HAD SOME FAILURES OF THE COUNTER GEAR RING BEARING AND HAD CHANGED THEIR RECOMENDED LUBRICANT TO 80/90 TO TRY TO CORRECT THE PROBLEM. FRANKLY , SOME OF THE BUILDERS RECOMMENDATIONS SEEM QUITE STRANGE IN THE LIGHT OF INTERVENING YEARS AND TRIUMPH'S RECOMMENDATIONS.

IN ADDITION TO THE USE OF MOTOR OIL THEY ALSO RECOMMEND DRAINING THE LUBRICANT EVERY 3000 MILES , WHICH I DON'T THINK ANY OF US DO OR HAVE DONE. AS A FINAL THOUGHT , I THINK I WILL GO TO MOTOR OIL AND CHANGE IT MORE FREQUENTLY , BUT I DON'T THINK THAT THIS IS A NECESSARILY GOSPEL. WE WILL CONTINUE TO RESEARCH THIS AND WILL REPORT TO YOU AS ANY NEW INFORMATION IS UNCOVERED.

KEN GILLANDERS - VOLUME 56 , MAY - JUNE 1987

"CLUTCH PLAY"

WHILE IN ROUTE HOME FROM ANOTHER FUN-FILLED TRSC OUTING LAST YEAR , MY FAITHFULL TR HAD A SPOT OF BOTHER WITH ITS CLUTCH. IT BEGAN AS A WEAKENING , THEN STEADY DEGENERATED TO A COMPLETE LOSS OF CLUTCH. I TRIED BLEEDING IT ON THE SPOT , BUT WITH ON IMPROVEMENT. FORTUNATELY , THE REMAINDER OF THE JOURNEY ONLY REQUIRED A COUPLE OF STOPS AND BY SWITCHING OFF AT EACH STOP AND RESTARTING THE CAR IN 2ND GEAR I WAS ABLE TO GET HOME WITHOUT ANY SIGNIFICANT PROBLEM.

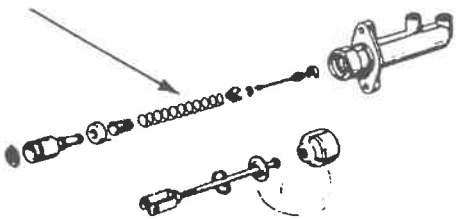
IT SEEMED TO BE A HYDROLIC PROBLEM , AND EXAMINATION QUICKLY CONFERMED THIS THE MASTER CYLINDER WAS NOT FUNCTIONING PROPERLY. USUALLY THIS MEANS THAT THE SEAL HAS GONE BAD , AND REPLACEMENT OF IT WILL CURE THE PROBLEM. THE EVIDENCE OF THIS IS GENERALLY A LOT OF LEAKING . IN THIS CASE HOWEVER , THINGS WERE A BIT MORE INTERESTING. THE SEAL WAS OK , BUT THE LONG SPRING WHICH ACTS AS A RETUN FOR THE PISTON ASSEMBLY INSIDE THE CYLINDER HAD BROKEN INTO THREE PIECES. THIS DOESN'T IMMEDIATELY CAUSE THE FAILURE , BUT WHAT HAPPENS IS THE PIECES BEGIN TO COIL AGOUND ONE ANOTHER AS THE CLUTCH IS USED , AND AFTER A WHILE , IT BECOMES TOO SHORT TO RETURN THE PISTON ALL THE WAY FORWARD THIS RESULTS IN INSUFFICIENT HYDROLIC PRESSURE TO OPERATE THE CLUTCH. THIS IS ONE CASE WHERE BLEEDING THE SYSTEM WILL NOT HELP.

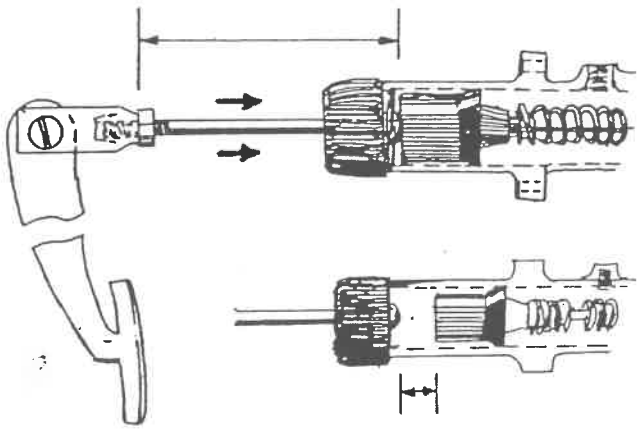
ONE WAY TO SPOT THIS PROBLEM , IF YOU EXPERENCE CLUTCH DIFFICULTY , IS TO CHECK FOR EXCESSIVE MOVEMENT IN THE OPERATIMG ROD BETWEEN THE MASTER CYLINDER AND THE PEDAL ARM. THERE SHOULD NORMALLY BE A VERY SMALL AMOUNT OF FREE PLAY IN THIS ROD , BUT MINE WAS OVER 1/2" - THAT WAS MY CLUE TO THE PROBLEM !

UNFORTUNATLY , THIS SPRING IS NOT INCLUDED IN A MASTER CYLINDER REBUILD KIT. SO MY ADVISE IS TO PROCURE ONE FROM A USED CYLINDER AND KEEP IT WITH YOUR EMERGENCY SPARE PARTS. BY REPLACING MY BROKEN SPRING WITH A GOOD ONE , AND BLEEDING THE CLUTCH , IT WORKED LIKE NEW. YOU SHOULD ALWAYS REPLACE THE MASTER CYLINDER SEAL IF YOU DISASSEMBLY IT FOR ANY REASON. REMEMBER , SINCE THE BRAKE CYLINDER IS THE SAME (ON THE TR3 SERIES ANYWAY) THIS APPLIES TO BRAKES AS WELL.

CHECK FOR EXCESSIVE PLAY BY MANUALLY PUSHING THE ROD AGAINST THE MASTER CYLINDER IF YOU FIND MUCH MORE THAN THE NORMAL .030" , THERE IS A GOOD POSSIBLITY OF A COLLAPSED SPRING.

THIS IS THE SPRING WHICH BREAKS.





THE PISTON DOES NOT COME COMPLETELY FORWARD WHEN THE SPRING COLLAPSES, AND THIS "GAP" BETWEEN PISTON AND ROD CAN BE CLEARLY FELT.

TECHNICAL ADDENDUM

THOSE WHO STILL HAVE THEIR "TRIBUNE" ISSUE #83 MAY REMEMBER THE ARTICLE "CLUTCH PLAY" IN WHICH I STATED THAT THE SPRING INSIDE THE GIRLING MASTER CYLINDER COULD NOT BE OBTAINED EXCEPT FROM A USED CYLINDER. BOB REINHOLD HAS KINDLY POINTED OUT THAT , AFTER EXPERENCING THIS SAME FAILURE (DISCOVERING IT AFTER READING THE ATRICLE) HE FOUND THAT THE MASTER CYLINDER REBUILD KIT FOR A TR4 (GIRLING #SP2152/1) CONTAINS A NEW SPRING WHICH IS THE CORRECT SIZE. ALTHOUGH THE CYLINDERS THEMSELVES ARE NOT THE SAME. SO , YOU NOW HAVE A SOURCE FOR A NEW SPRING ..... THANKS FOR THE TIP BOB !

ALLOY DIFFERENTIAL COVERS

STARTING ABOUT 4 OR 5 YEARS AGO WE BEGAN TO EXPERENCE SUDDEN AND SEVERE PROBLEMS WITH THE DIFFERENTIALS IN THE TR VINTAGE RACE CARS. THE FAILURES SEEMED TO MIRROR PROBLEMS THAT SOME OF THE STREET MACHINES WERE SUFFERING FROM IN THAT WE WERE SUFFERING BROKEN RING GEARS AND SPIDER GEARS WITH NO WARNING

ABOUT TWO YEARS AGO A PARTICULARLY DESTROYED RING GEAR WAS GIVE TO A METALURGIST TO DETERMINE THE CAUSE OF THE FAILURE , AND IT WAS DISCOVERED THAT THE FAILURES WE WERE EXPERENCING WERE CAUSED BY SEVERE OPERATING TEMPERATURES.

FOR SOME TIME WE WERE AT A LOSS AS TO WHAT WE COULD DO ABOUT IT , BUT NOW WE MAY HAVE AN ANSWER. AUTO IMPEX IN ENGLAND HAS BEEN CHASING THE SAME PROBLEM FOR SEVERAL YEARS AND THEY REASONED THAT IF WE COULD LOWER THE TEMPERATURE OF THE LUBRICANT WE COULD REDUCE THE OPERATING TEMPERATURE OF THE MECHANICAL COMPONENTS. THEREFORE , THEY HAVE DESIGNED AND PRODUCED AN ALLOY DIFFERENTIAL COVER. AS THIS UNIT FITS TR2 THRU TR6 , IT HAS THE PROVISIONS TO BOLT ON THE REAR DIFFERENTIAL MOUNT FOR THE IRS , AND THIS CAN BE USED TO MOUNT THE PLATE FOR WATTS LINKS IF YOU ARE SO INCLINE. THE UNIT WAS TESTED IN ENGLAND AND RESULTED IN A DECREASE OF ABOUT 30 DEGREES F IN GEAR OIL TEMPERATURE EVEN WHEN UNDER SEVERE OPERATING CONDITIONS. THE UNIT SELLS FOR ABOUT THE EQUIVALENT OF $150 IN ENGLAND AND WE ARE NEGOTIATING AN ARRANGEMENT TO BRING THEM TO THE US AND STILL BE ABLE TO SELL THEM FOR ABOUT THE SAME PRICE. I WILL KEEP YOU POSTED.

KEN GILLANDERS - VOLUME 83 , MARCH 1990

TRANSMISSION

For those of us who have overdrive and have ever experienced the failure of the OD relay, the delay and expense of getting a new one is a typical trial of dealing with Lucas. However, there is an alternative that works just as well, appears to last longer, and is considerably cheaper. This is the Niehoff UM 154, a headlight relay which is available from different vendors under their different numbers. This unit is fused for its protection and has screw-type connectors. Its price is around $8 to $10.

Here's how to connect it.

1. Take the wire from the original relay terminal marked C-2 and connect it to the UM 154 terminal marked "lights". This is the wire to the solenoid.

2. Take the wire from the original relay terminal marked W-1 and connect it to the UM 154 terminal marked "switch". This is the wire to the starter solenoid white feed side.

3. Take the wire from the original relay terminal marked W-2 and connect it to the UM 154 terminal marked "ground". This is wired through the switch to the transmission lockout switche

4. Take the wire from the original relay terminal marked C-1 and connect it to the UM 154 terminal marked "battery". This is the wire to the primary power source.

This will result in a long-lasting, easily obtained and inexpensive cure to at least one of our Lucas ills. This unit and others like it from other makers are used extensively on off-road vehicles to power their lights, along with many other uses, making them readily available.

Ken Gillanders
Newsletter #21

OVERDRIVE FAULTS

The trip back from the Moss Motors event gave me a not-so-gentle reminder of a problem that can crop up in the electric overdrive that can give you pause to wonder whether it was such a bright idea to put one in your car or not. As so many of our TR's are being converted to overdrive, a general rundown on faults, and on particular problem, appears in order.

Fully 90% of overdrive problems that are not electrical faults are traceable to either the gear oil level being too low, or an improper adjustment of the solenoid, so we'll skip these and concentrate on the others.

An overdrive that fails to engage can sometimes be traced to dirt between the check ball and seat in the pressure regulator valve, or sometimes to a badly worn pump. Both are quite rare, though possible, so don't overlook them. Worn or broken rings on the apply pistons or the accumulator piston can make for a lazy-shifting or slipping unit.

However, the real winner is a partially or completely blocked by-pass port in the operating valve. The valve, which is activated by the solenoid through the operating shaft and lever, has a small hole bored in it (approx. .018) which is very easily blocked by dirt, etc. The results of blockage can be real fun to find. First, partial or intermittent blocking results in slow engagement, but most noticable is that there is no compression-assisted slowdown. The unit appears to hang between overdrive and direct drive and feels like it is not in gear. Basically what is happening is that the partially blocked valve will not allow the oil to return to the sump fast enough, and the pressure build-up above the valve tries to engage the overdrive while the unit's springs try to engage direct, and there we hang between the two. The real fun begins when the by-pass port becomes completely blocked. At any speed above mph, the pressure above the valve becomes high enough to engage overdrive, no matter what you do or where the switch is.

Fortunately, the valve blockage is easy to repair. With the trans tunnel removed, the access to the valve is on the right side of the top of the overdrive unit and is under a 7/16" plug. Actually under the plug is a spring and check ball assembly which can be removed with a small magnet. The valve will also come out with a magnet, and after it is cleaned, can simply be set back in place, hole in end facing up, followed by the ball and spring assembly. It is very straightforward and easy to remedy once you find it.

Ken Gillanders
Newsletter #28

LEAF SPRING FRONT BOLTS

I RECENTLY WENT THROUGH ONE OF THE MOST FRUSTRATING JOBS I'VE EVER DONE ON MY TR3A ; REMOVING THE BOLTS THAT GO THROUGH THE FRAME AND THE FRONT EYE OF THE REAR LEAF SPRING.

I WON'T BORE YOU EITH THE DETAILS OF BROKE DRILLS , BROKEN TAPS , BROKEN TAP EXTRACTORS , AND THE SETTING FIRE TO THE CAR !

I WILL OFFER THE FOLLOWING PEARLS OF WISDOM , PAINFULLY LEARNED

KEN GILLANDERS RECOMMENDED USING SAE GRADE 5 OR 8 THREADED ROD STOCK TO JACK THE BOLT OUT . IF THE BOLT IS RUSTY LIKE MINE WAS , YOU'LL NEED THE STRENGTH I BROKE OFF THE GRADE 3 ROD STOCK FLUSH WITH THE HEAD OF THE BOLT . THAT WAS THE BEGINING OF MY PROBLEMS .

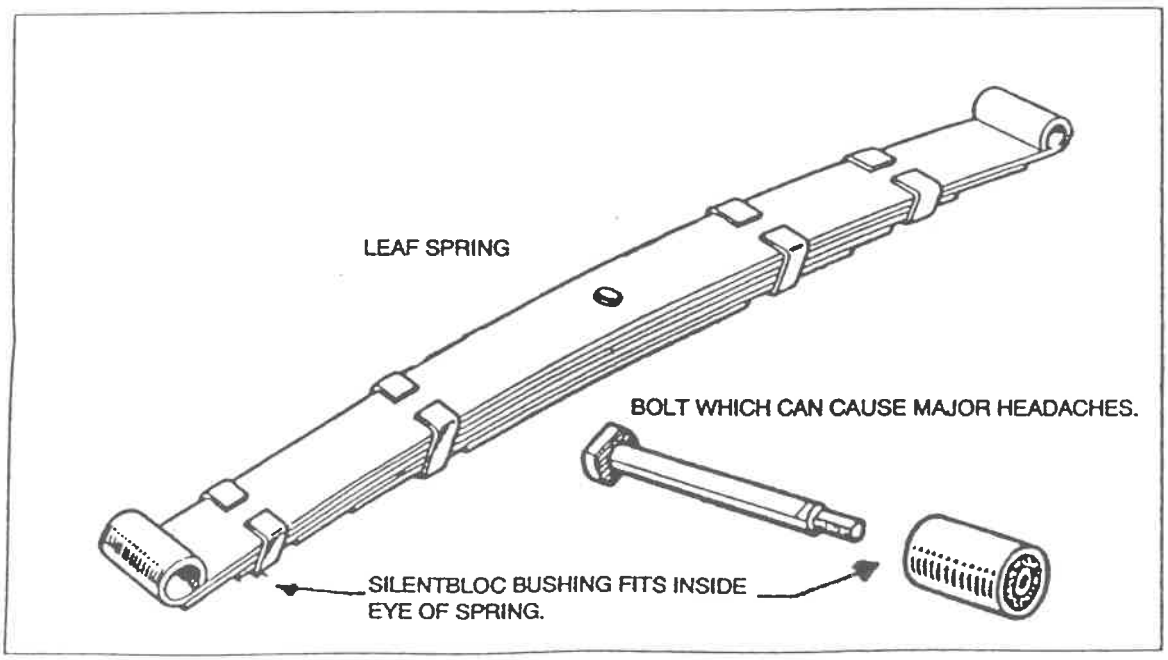
IF YOU DECIDE THAT HEAT IS A GOOD IDEA ON A BOLT , DON'T SPRAY LIQUID WRENCH ON IT WHILE IT IS HOT ! WITH NO EXPOSED FLAME (TORCH OUT) , THERE WAS ENOUGH HEAT TO CAUSE A FLASH FIRE . I WAS UNDER THE CAR , WHICH WAS ON JACK STANDS , WHEN I TRIED THIS.

I FEEL PRETTY FOOLISH CONFESSING THIS , BUT MAYBE I'LL KEEP SOMEONE ELSE FROM GETTING HURT . I WAS LUCKY , I NEEDED TO CHANGE MY UNDERTHINGS ANYWAY !

I FINALLY DECIDED THAT I HAD TO POUND THE BOLT OUT FROM THE OUTSIDE OF THE CAR . WITH THE BODY ON THE CAR , THAT MENT PUTTING A HOLE UNDER THE SMALL STONEGUARD (THE FOOT - ED.) AHEAD OF THE LARGER ONE. THE MISTAKE HERE WAS THAT I TRIED TO MINIMIZE THE SIZE OF THE HOLE.

I BOUGHT A LONG , SMALL DIAMETER PUNCH TO POUND ON THE END OF THE BOLT , BECAUSE THE AREA AT THE END OF THE PUNCH WAS SO SMALL , THE BOLT EXPANDED ON THE END WITH EVERY BLOW OF THE SLEDGE. I FINALLY BOUGHT A PIECE OF 1/2" STEEL ROD , AND THEN THE SLEDGE PREVAILED . THE HOLE IN THE BODY WAS STILL SMALL ENOUGH FOR THE "FOOT" TO COVER IT. I MIGHT ADD THAT THE BOLT ON THE OTHER SIDE CAME OUT EASILY -- IT SIMPLY "WITHDREW" , AS THE SHOP MANUAL SAID IT WOULD

MIKE MOORE - VOLUME 70 , JANUARY 1989



OBSERVATIONS OF AN ITINERANT MECHANIC

In looking for a good second hand stub axle for a TR I noticed that a fairly high proportion of the axles I inspected showed significant signs of wear in the seating area of the bearing inner rings; particularly the seat of the smaller outer bearing.

The signs ranged from the surface of the metal having a polished appearance (some were like mirrors) to significant ridging of the axle shaft.

The wear is caused by the rolling resistance of the bearing rollers being greater than the resistance to slippage of the bearing centre on the shaft; play between the wheel and its axle caused by a worn bearing seat cannot be corrected by adjusting the bearing retaining nut and although the wheel may not feel loose when rocked by hand after adjustment this is only because the adjustment process has caused the inner bearing to move on to the edge of the wear ridge.

Correction

Any stub axle showing obvious signs of ridging should be replaced; a temporary solution is to use a Loctite compound such as 241 or 262 to take up the wear; the mating surfaces of the axle and bearing should be clean and wiped with acetone or thinners before applying a few drops to each surface and sliding the hub assembly and outer inner bearing into place.

As the hub and bearings must be greased before assembly it can be very difficult to keep grease off the cleaned areas.

It is also important to carry out the bearing adjustment procedure before the compound hardens.

Polished areas of the stub axle should be lightly scored with # 320 wet and dry paper rubbed lengthwise before final cleaning.

A threadlock compound such as Loctite 242 or similar should be used when fitting hubs to axles in good condition; the inside of the inner bearing ring should be wiped with a slightly oily rag before applying the compound; this assists when releasing the bearing.

Setting of the hub retaining nut

My usual practice for this operation on a TR is to tighten the nut until a definite resistance to rotation by hand is felt, the nut is then backed off one flat and the hub turned several times in both directions; the nut is then backed off until the retaining washer can be moved sideways with a 15cm screwdriver; a split pin is then fitted to the nearest available hole; if in doubt, tighten the nut slightly to line up the hole rather than loosen it.

A loose front wheel hub can cause erratic braking and uneven lining and pad wear; with disc brakes in particular it can be the cause of excessive brake pedal travel because the caliper pistons have to travel further before effective pad contact is established.

An inner bearing centre that spins on its axle can, in extreme cases, generate enough heat to destroy the bearing and break the axle; it can otherwise be the source of the most wondrous range of squeaks, screeches, grates, and graunches that ever assailed the ears of an open car afficionado.

Observations Of An Itinerant Mechanic

Setting up the clutch slave cylinder in TR's

A number of TR2 and TR3 owners seem to have had trouble with the Lockheed slave cylinder arrangement as used on early TR's; this slave cylinder is made of cast iron, has a larger bore and is shorter in length than the later Girling type which is aluminium.

The most common complaints relate to delayed operation or failure of the clutch to engage when the pedal is released; also excessive slipping of the clutch when engaging and loss (often total) of fluid.

The above problems can be caused by the slave cylinder piston being located too near the mouth of the cylinder and thus tending to jam in use or even come out altogether. The mislocation of the piston can be attributed to incorrect adjustment of the fork/rod assembly or the fork/rod assembly being the wrong type (i.e. too short).

Correct slave cylinder piston and fork/rod set up

With the clutch engaged and the pedal free the slave cylinder piston should be at the BOTTOM OF THE CYLINDER BORE and held there by the return spring attached to the fork clevis pin and slave cylinder mounting bracket.
It should be possible to move the fork/rod assembly by hand and against the return spring about 0.050in - 0.080in (1 to 2 of the push rod threads) - Try pushing the fork/rod in against the piston (push HARD) to ensure the piston has bottomed and then pull out to gauge the amount of play.

If adjustment is necessary first ensure that the slave cylinder piston is at the bottom of the bore, then adjust the length of the fork/rod assembly so that end play is just removed; hold the rod and adjust the lock nut until it bears against the fork.
Still holding the rod undo the lock nut one and a half to two turns then screw the rod into the fork until the nut touches the fork; tighten the lock nut.
It is advisable to remove the return spring while carrying out the above adjustment.

Check that the slave cylinder bleed screw is in the UPPER HOLE; the Girling system adjustment procedure is substantially the same.

REPAIRING WOOD SCREW HOLES

Early TR2's, TR3's and TR3A's used wood in the doors for affixing various parts, including inner door panels, and side curtain holders. Over the years the screw holes in the wood may become enlarged with the result being that screws will no longer hold. The following is a simple repair.

- Remove the door panels.
- Using hardwood food skewers (available in packages of 50 to 100 at grocery stores), fill the holes with Elmer's white glue, insert the tips of the wood skewers in the holes and break them off. Pack the skewers tightly into the holes.
- When the glue has dried, cut the protruding skewers bodies flush with the wood surface.
- Screws may now be inserted in their original locations and they will hold with their original strength.

Clutch Bleeding Tips

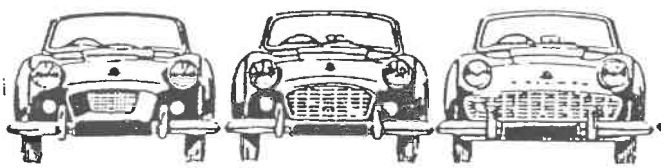
by Norman Nock, British Car Specialists of Stockton, CA
Reprinted from January 1993 "Spanner News" of the
British Auto Club of Las Vegas

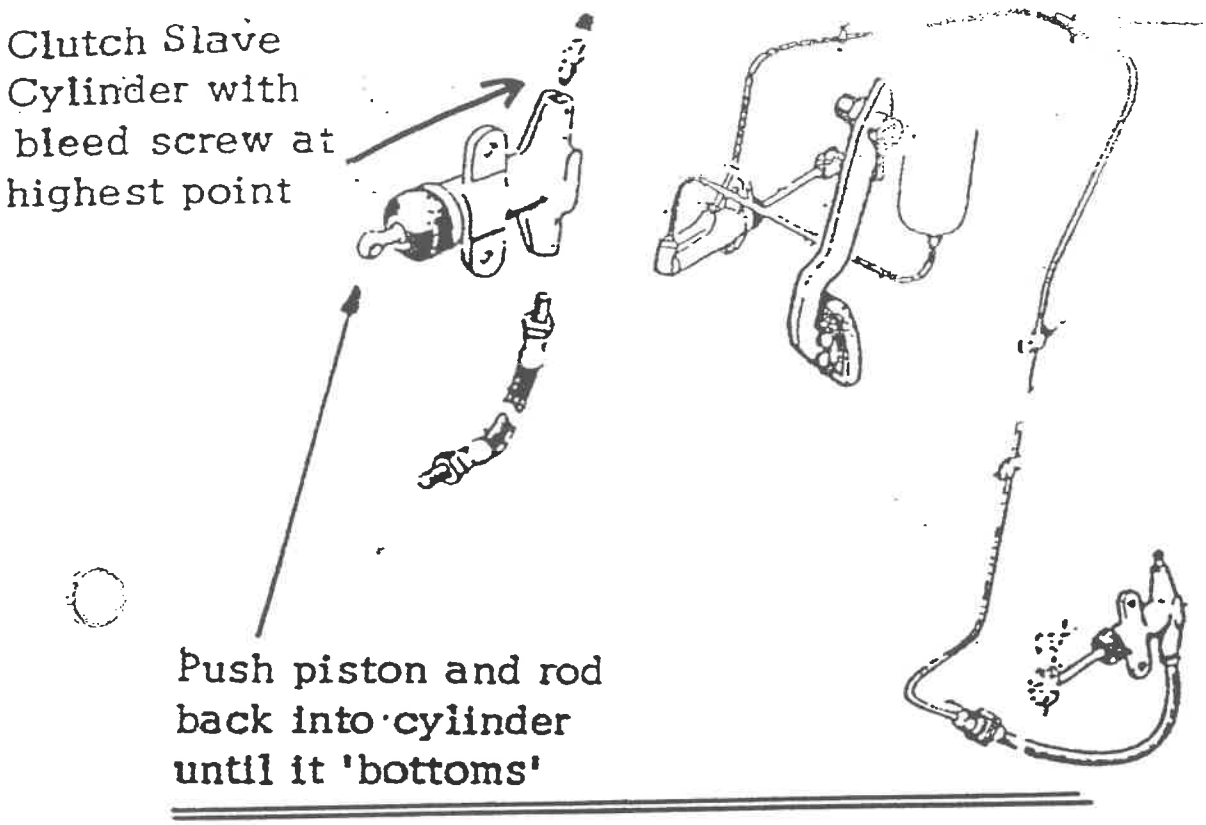
Sounds like a simple job, but we have received many calls from owners of British cars who have rebuilt the clutch hydraulic system and replaced the clutch slave cylinder hose, only to find that they still have a very soft pedal that will not release the clutch to allow silent engagement of first or reverse gear. Some owners then try replacing both master and slave cylinders and the clutch and still experience the same problem. Eventually, they tow the car to the local British car specialist and he fixes it. Now, what did he do that the other didn't?

The reason for bleeding the clutch (or brake) hydraulic system is to remove ALL the air bubbles from the system. Liquid (brake fluid), for all intents and purposes, is not compressible. Air left in the system will compress, or become smaller, upon application of the pedal (gives the "soft pedal" symptom), allowing the pedal to travel without moving the piston in the slave cylinder enough to operate the clutch release lever.

Where is the air in the system, and how do we get it out? Air in the hydraulic system will always go to the highest point. In this case, it could be stuck in the pipe between the master and slave cylinders. Begin by bleeding the system in the usual way, with a hose fitted to the bleed screw on the clutch slave cylinder and the other end immersed in a container of clean Girling brake fluid (do NOT use anything else). After you have moved about half a pint of new fluid through the system, close the bleed screw with the clutch pedal NOT depressed to the floor. Now, by hand, push the slave cylinder piston, using the rod, back into the body of the cylinder. This would cause any air bubbles in the highest point of the pipe to be forced back through the master cylinder and into the reservoir, exiting into the atmosphere. Now, try pumping the clutch pedal a few times... you should have a firm pedal. If not, try pushing the piston into the slave cyliner by hand again, using the actuating rod, without bleeding the system again.

While you're doing this, don't forget to check the fulcrum pins at the top of the pedal assembly, and replace worn ones with an oversize pin.





OIL COOLERS

Ken Gillanders

I frequently get requests to provide information about the use of oil coolers. These requests rarely come from racers, but rather from those interested in high speed motoring. My usual response is that there is almost nowhere here where you could drive a TR fast enough for long enough to create an oil heating problem. You are actually more likely to go critical with oil temperature in a parade at 2 mph.

However, for those of you are are interested, Flo Tec of England just made it a whole lot easier. One of the problems with the early oil pickup blocks fitted between the engine block and the oil filter head was that the oil supplied to the cooler was not regulated before reaching it. On a cold morning, the ability of the oil cooler core to pass oil was drastically less than the oil pump's ability to supply it, with split seams in the cooler as a result. For several years we had a parade of solutions, some sensible and some definitely `Rube Goldberg.' Now Flo Tec has come up with a solution to the whole thing that makes you ask, "Why was it always so much trouble before?" Their solution is to mount a conventional spin-on oil filter adapter to the filter head and to make up another adapter about the same thickness and diameter that matches up to the bottom of the filter adapter and allows the spin-on filter to be attached to it. Both inlet and outlet fittings are in the cooler adapter and by virtue of the pickup point being after the pressure regulator, the oil supplied to the cooler is never at an excessive pressure. The best location for the cooler depends on the car model, but if you are going to mount it in front of the radiator, get it as far ahead as possible. Always use armored oil lines and be sure you don't make any tight turns or allow them to rub against any edges likely to wear through the line.

An oil cooler properly installed does help with the boy racer image, especially when the owners of TR-3's and 3A's leave out the grille so that everyone will be suitably impressed!

Rear Leaf Springs

by Ken Gillanders

While it is not exactly a common repair, removal of a rear leaf spring can be a perplexing chore. It is largely straightforward until we come to the removal of the front pin.

The front mounting pin passes through the chassis frame and when in place, protrudes on the outside far enough to pass through the eye in the front of the spring, with the threaded end protruding far enough to accept a washer and nut. So far, so good. The pin, however, also passes through a tube built into the chassis frame, being a slip fit (that is, until the pin and tube get the chance to rust together!). This pin has a flat spot on its head which locates it against a stop that is welded to the frame. The whole idea is to prevent the pin from rotating inside the tube. The head of the pin is drilled and threaded to accept either a 5/16" NF bolt, threaded rod, or special tool to remove it.

However, here is where things get a bit sticky. Over the years, the pin invariably rusts into the tube, and from this phenomonon comes all the Triumph folklore about the horrors of trying to remove the (expletive deleted) pin.

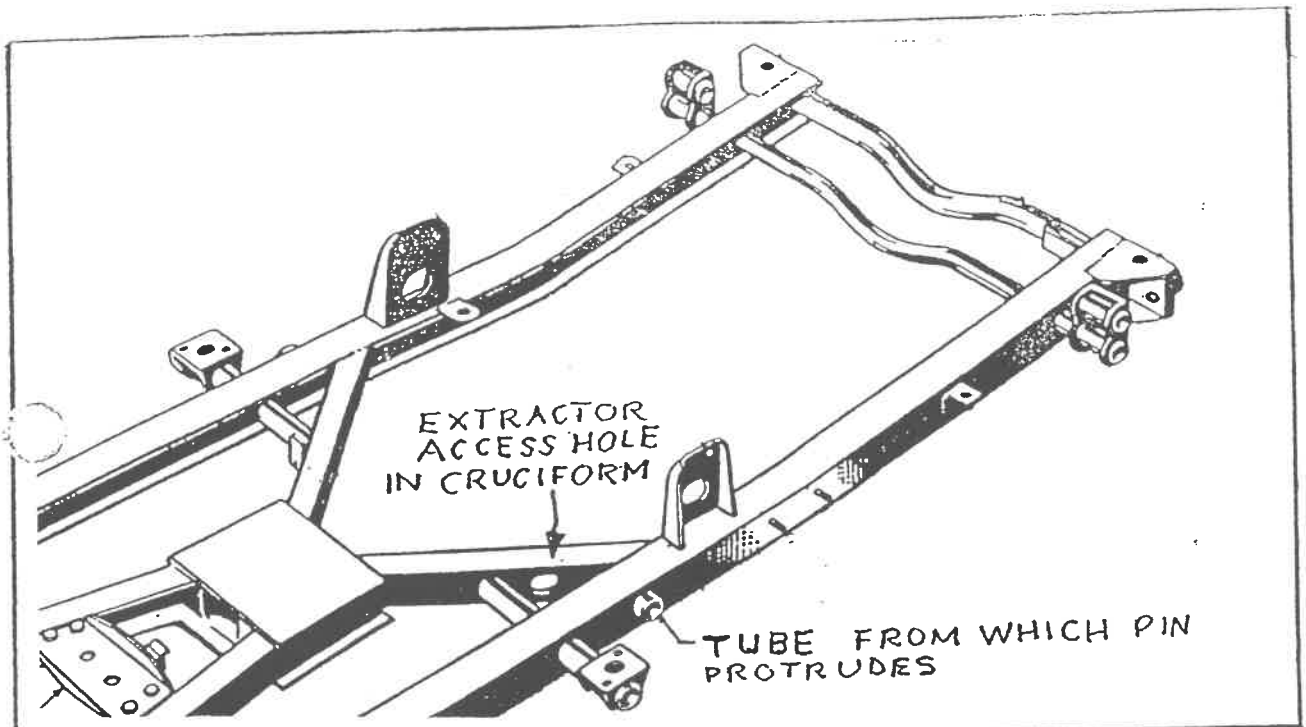
First, a few general suggestions: 1. Use grade 5 or grade 8 bolts or threaded rod in the pin head - if you lose those threads you are a dead duck, since you will likely have to cut a hole in the exterior bodywork opposite the pin and drive it out from outside the car. 2. Take your time. I gave both pins a good bath in penetrating oil on each end over a period of five or six nights, in which time the capillary action of the oil dissolved most of the rust, enabling me to remove the pins. 2. Be sure that whatever you use over the head end of the pin to pull against will loosely cover the head as well as the stop that is welded to the frame, to prevent binding. I used a length of pipe long enough to pass through the access hole in the chassis cruciform. 3. Try to avoid situations where the turning is taking place in the head of the pin. Try to find a solution where you can thread your extractor bolt or rod fully into the pin head and do the tightening from the other end.

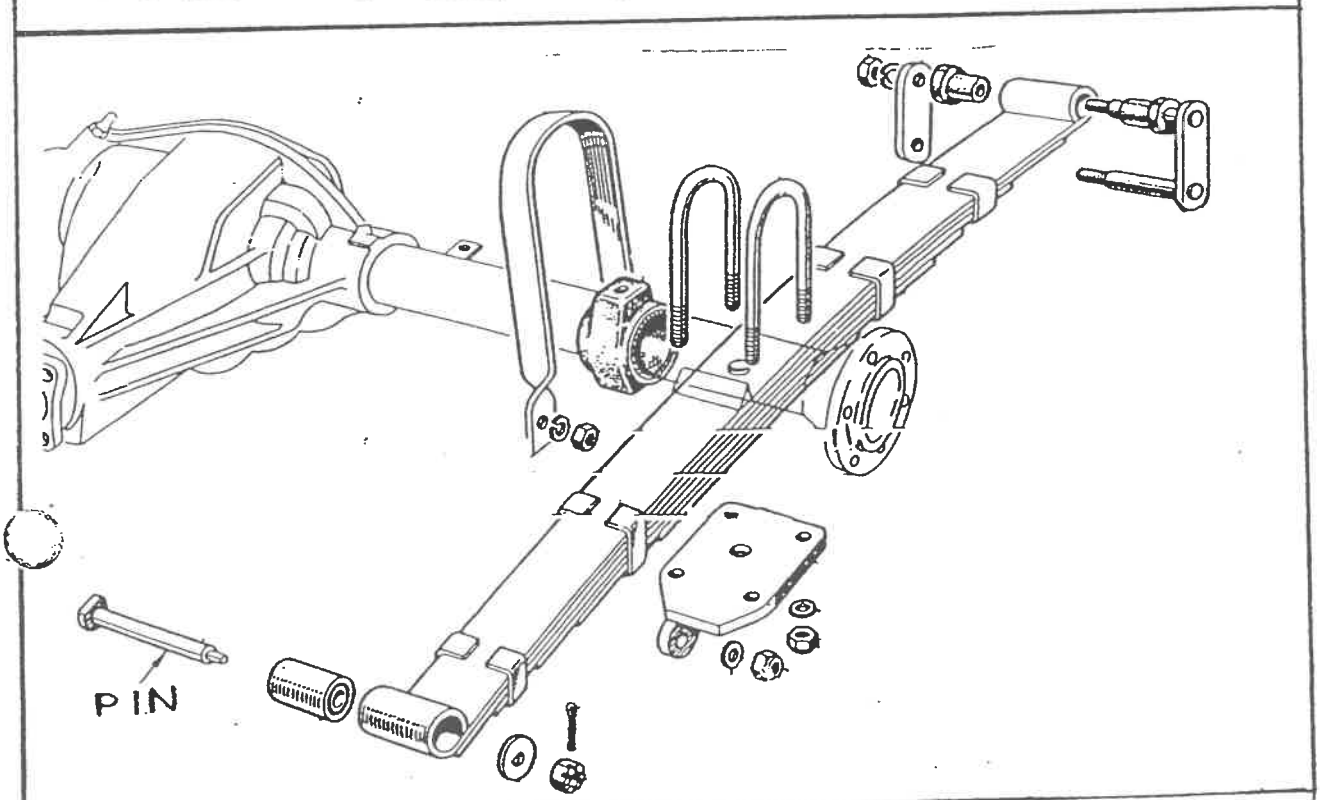
Don't use any more force than is absolutely necessary. Excessive force will only net you destroyed threads. Use penetrating oil, heat if you must, and prayer is appropriate, but keep the pressure on the threads to a minimum.

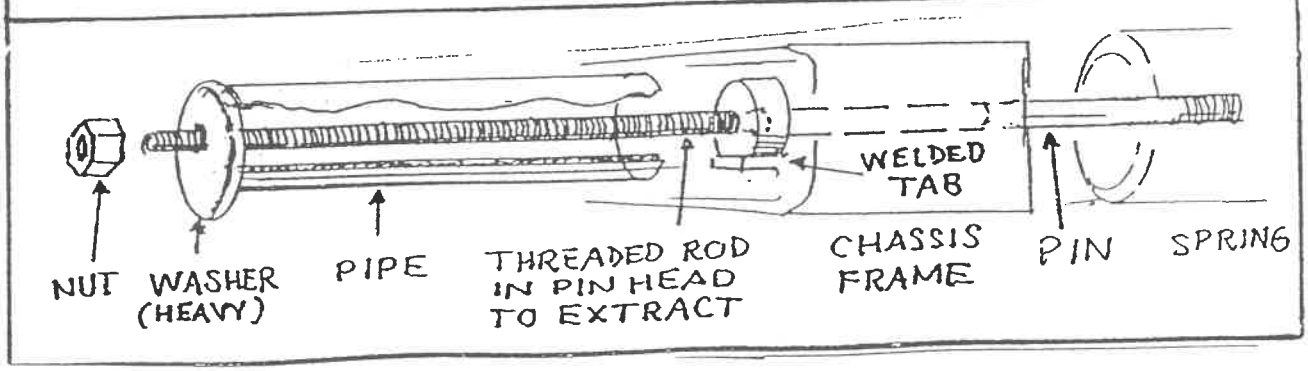
When you re-install the pin, be sure you remember how hard it was to get out! Thoroughly clean the pin and the inside of the chassis tube, then apply grease, or an anti-seize compound to both surfaces, as well as the metal inner sleeve of the silentbloc bushing at the front of the leaf spring.

English TR owners have had so much grief with these pins that they are now making them out of stainless steel, which have

A lot of this aggravation could be avoided if you did this job while the body is off the frame, but unfortunately, springs seldom break while you are doing a frame-up restoration!







GEARBOXES.

Dave Jackson.Canada.

Quite some time ago I promised "mm" an article on gearboxes and now after relocating our residence and closing down my business and moving 25 - 30 years of accumulated "stuff" (junk to most people....valuable bits to others)!, I have finally found time to complete it !! I was practically guaranteed fame/notoriety (not sure which), So here goes!!!

Over the years I've overhauled many gearboxes, mostly British and quite a few shortly after a so-called major rework. All were dismantled again because of : Noisy bearings, poor synchros, unecessary rattles and/or oil leaks. The one and only Japanese transmission impressed me with its ease of assembly. i.e. bearing fit - all were easily fitted by hand. Not so with TR gearboxes.

I'll try to itemize procedures, etc. that have worked well for me.....

1. NEVER drive-fit bearings, ALWAYS use a press.
2. The mainshaft bearing is much too tighton the shaft. I always polish the shaft so that the bearing is a hand-push fit. (use an old bearing to check). The bearing is located on the shaft with a snap-ring, and a spacer between the snap ring and the bearing. Correct any clearance between the bearing and the spacer with stainless steel shim stock. Make sure shim is between the bearing and the spacer.
3. Countersink all bolt and stud holes and clean out threads with a bottoming tap of the appropriate size. Use compressed air to blow out swarf.
4. Use a fine tooth (large) flat file to remove any high spots on mating surfaces. (gently please).
5. Make sure all end float clearance are at or slightly below (.001') factory specs. This will assure a quiet rattle-free gearbox.
6. No selective thrust washers were ever available for the laygear (countershaft gear) so that the only way to correct excessive end play is to machine a new spacer to fit between the input gear (constant gear) and the 3rd gear. The spacer must be pinned to prevent rotation. If allowed to r tate, it will wear, thereby increasing clearance. One 3/32" roll pin will do the job. (roll pin hole in constant gear will have to be bored by E.D.M. If the constant gear thrust surface is scored, correct by grinding (making note of amount removed). Remove this amount from the front gearface (usually no more than .005" -.010") and reharden the gear (ion-nitriding has worked for me)
7. The best countershaft bearing has proven to be the Torrington type with its own outer casing. I call this the crowded roller type as opposed to the caged roller type. It has a much higher load carrying ability. The c/s gear can be internally ground to take two bearings at each end. Press bearings into place and retain with red Loctite and snap rings. Use 75W 90 synthetic gear oil (not in overdrive hearboxes). With regard to lubricants on OD gearboxes, I have been told by several people that Laycock never reccommended that gear oils be used in their overdrives. I haven't been able to confirm this as a fact. Does anyone have more information on this ?

I have overhauled many TR o/D boxes but have never had the nerve to use motor oil (as per MGB specs). As a side note, the lube spec for TR7-8 gearboxes was changed from gear oil to auto trans fluid. This was to prevent the oil pump from self distructing With no oil pump the gearbox would destoy itself.

Ed.note.See note elsewhere in mag.re using ATF...mm.

Has anyone tried auto-trans fluid in O/D boxes??

8. If the gearbox is O/D equipped, the planetary gearunit MUST be dismantled. The gear shafts are hollow and will clog with metal particles and prevent lubr ation for the planetary gear needle rollers. The shafts can also be damaged.

RE-ASSEMBLY

1. Absolue cleanliness is mandatory!
2. Permatex No.2 sealant does a very good job (appears to be the same as Wellseal).
3. Apply a smear of sealer to front face of the front seal and PRESS int place.
4. Try to avoid silicone sealers (I personally detest the stuff!). If you must, use very sparingly).
5. To repeat - always press fit bearings.
6. Seals and snap rings are expendables....Don't use them twice!

I hope this helps with any gearbox problems and I would really appreciate ány comments, information or hints. Please write. I WILL reply.
Dave Jackson, 3984, Hwy No.2. RR No.8,NEWCASTLE,ONTARIO,CANADA L1B 1L9
PH/FAX (905) 987 8652

----------oOo----------

Thanks,Dave,for the foregoing piece.If anyone has comments,suggestions to add regarding gearbox overhaul,perhaps you would like to direct them through these pages so that we might all benefit.... mm.

----------oOo----------

GEARBOX LEAKS ?

Left as it was, my recently restored TR2 would never have rusted rear of the gearbox. The previous owner assured me that the gearbox and overdrive "had been done-up" and a lift-the-cover inspection seemed to verify that something had been done.

Oh - foolish boy ... fancy believing the vendor! Anyway, I had run out of time and needed to get the car on the road for the Hunter Valley run. A static test with the engine in the chassis revealed that all gears were selecting and the overdrive seemed to operate. More importantly, there were no signs of leaks.

Body on, car registered and a few test trips. Overdrive was indeed working but top gear synchro was non-existant. First nagging doubts - this was supposed to be done-up. What were the small oil stains appearing over the back of the car ? Why is there a grimy dust-caked film of oil appearing on the meticulous chassis paintwork (which only I can see of course) ? The rapidly lowering gearbox oil level seemed to be telling me something. But then again, so was the rear main oil seal, the sump gasket and every joint in the rear axle giving me a message. The solution to the latter three "oozings" is another story, so I will concentrate on the dreaded gearbox leaks.

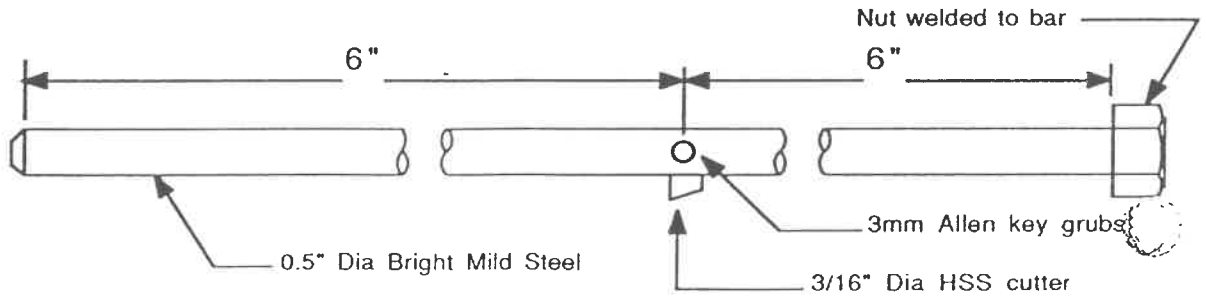
By the way, the "done-up" overdrive was now becoming exceedingly reluctant to change. The excellent articles that our editor has presented revealing the mysteries of the overdrive unit were constant companions. (See the August and October 1991 issues). I did all the tests Ken Gillanders suggested - removed the large bronze plug to see if the filter was "completely covered in trash" (to use his words). Trash is not quite the right word. "Oil refinery sludge" would have been more appropriate. Drain, clean, flush and re-fill and we have an operating overdrive once again. Well, actually, it was still a little bit slow to engage so clever Rick thinks that a second clean, flush and refill will work wonders.

Brilliant ... now the damned thing won't work at all. In the meantime I have managed to break an axle outside the pub at Mt. Victoria (another story) so figure that I might as well remove and strip the gearbox and overdrive seeing that the rear axle was scattered all over the workshop. Minor tasks like seats out, carpets removed and lifting a tunnel cover that I had sealed into place with about 2 kg of Mastic revealed a gearbox which seemed to fit so easily when the body was off. Now it managed to catch on every conceivable part of the body. One small hernia and some help from the daughter's boyfriend (knew they had to be useful for something) prised the device from the car.

Rear gearbox support was absolutely dripping with oil which had appeared to be coming from the joints between the gearbox, adaptor plate and o/drive body. Not so ! Streams of oil had left their indelible imprint on the gearbox casing and they started just below the gearbox selector shafts. From there the oil ran down the outside of the gearbox following the previously mentioned joints and then blew back in the slipstream.

I can only speak for TR2 gearboxes, but the method used to seal the selector shafts in my gearbox cover was by means of "O" rings sloshing around in an overly large counterbore. This appeared to me to be a less than -precise engineering solution. In fairness, I suspect that the original seals may NOT have been "O" rings, but simply a tight fitting cylindrical rubber seal.

These ineffective "O" rings seemed to be the source of the trouble. A few measurements and enquiries revealed that a modern oil seal of the correct dimensions is available but not readily over the counter in NSW. The nearest easily obtainable seal is the type which is fitted to the Holden Trimatic gearbox selector shafts (PBR # PR6361). They are 1/2" ID but require boring out to 0.75" to accept the OD. A few more calcs. revealed that there was enough "meat" in the gearbox cover between the shafts to allow these seals to fit so I constructed a boring tool to the specs shown in the attached drawing.



The tool can best be turned by means of an appropriate socket and brace type drive. Fine adjustments need to be made to the distance that the cutter protrudes so that the counterbore matches the OD of the seal. Trial fit the seal when the counterbore is only 1 or 2 mm deep - the counterbore needs to be 0.187" deep. Kerosene is the correct lubricant for aluminium. A tiny amount of silicone rubber around the outside of each seal will ensure a completely oil-tight selector shaft.

While everything was apart, I replaced the seal on the valve operating shaft (item no. 12 on Plate AW in the parts book). I used a PR # 1001 for this but the machining of the solenoid bracket assembly is a little tricky and requires access to a lathe and 4 jaw chuck. When reassembling the gearbox and overdrive unit, I used a very thin coating of Loctite Permatex No. 4 jointing compound on each mating surface and replaced the overdrive drain plug gasket with a home-made neoprene rubber gasket.

What was the result ? Well, I should never have boasted that I have a "leak-free" gearbox because people are looking and checking ! However, the gearbox *does* seem to be free from rivers of oil - the top and sides of the box are *completely* dry and the bottom surface of the box is only very lightly coated with oil from the rear main engine oil seal. I can actually park the car in someone's driveway without leaving a messy calling card and there is no longer a coating of oil all over the under side of the car. I am running Shell Dentax 90 oil in the gearbox and overdrive. This appears to have similar specs to the Penrite oils which featured in a previous newsletter. Apparently there are no harmful additives and the oil is certainly remaining reasonably clear.

I hope this article may be of some help to others. The boring tool is available if you would like to borrow it or give me your gearbox top cover (stripped of selector shafts and clean) and the 3 Trimatic seals and I will fit them for you. Can I take this opportunity to thank all of the members of the Register who have so freely offered help and advice during the rebuild of my car. Having been a member of a number of clubs all over the state, both Joan and I agree that the TR Register is the most friendly and helpful we have experienced.

Rick Fletcher. (047) 395257

TR GEARBOXES AND OVERDRIVES

I was most interested to read David Jackson's article on TR gearboxes. I have no problem with most of his statements, but find some of his comments difficult to understand.

I see no point in making the only 2 ball bearings on the gearbox mainshafts a push fit. If you have the proper gear (i.e. Churchill type jigs) there is no difficulty in pulling off or pressing on bearings. It is essential that these bearings do not move on the shafts and relying on circlips to hold the bearings in place, is doubtful engineering practice at best, especially in a box which has been designed for a press on fit. I have seen disastrous results of bearings spinning on shafts with consequential gearbox failure.

The point about end-float specifications is spot on, but if there is any movement allowed by bearing movement these end-float measurements tend to alter with difficult and noisy gear changing as a result.

When refitting or replacing synchromesh rings, there must be a minimum of 0.025" to 0.030" gap between the ring and the shoulder of the synchro cone on the gear, otherwise difficult gear changes are the order of the day. Make sure that any TR synchro rings have the extra radial slits in the ring to cut the oil more quickly. Most TR boxes were built without radial slits.

I do not understand Dave's point number 6. I agree that the front and rear thrust washers are practically all the same thickness and it is therefore sometimes necessary to install a longer spacer between the 3rd layshaft gear and the constant gear to correct any excess end-float. If you can make an oversize spacer (normally these are 1.080" long) why is it necessary to pin this spacer? All gears on the layshaft fit on a spline, so why would such a spacer rotate? It is only under compression when in 1st, 2nd or 3rd gear. Triumph never pinned their spacers and they did <u>not</u> wear. In fact, I have measured dozens of these spacers and they are all within 0.001" of the length given above.

Actually, when I need a longer spacer, I use 2 spacers (It's cheaper). Cut one in half, just one side of the oil hole and cut another to make up the extra length. The steel is of top quality (60 ton steel) but can be turned in a lathe. It machines with a blue chip, but gives an excellent finish. These 2 "half" spacers can be slipped on in place of the original and the excess end-float is taken up. It is not a bad idea to make one of the new spacers 2 or 3 "thou" longer than is needed so that it can be ground down on a flat plate to the exact length necessary.

The practice of internally grinding the rear end of the layshaft gear and installing 2 bearings in tandem is an excellent one and eliminates any further problems with gearbox explosions! As far as doubling up at the front end of the layshaft is concerned, I have never found it necessary as the load at this end is very small compared with the opposite end. The nearest real load to the front bearing is some 3" away with the 3rd gear. The needle roller bearings used in the layshaft gearing are:

Rear: Torrington BH1312 (X2)
Front: Torrington TB1314 (Single)

Both of these bearings are of the full compliment type.

OILS FOR TR GEARBOXES WITH OVERDRIVE

There is a number of brands of oils which can be used satisfactorily The important point to realise here, is that gearbox oils and engine oils are graded on a DIFFERENT SCALE. Consequently, an SAE50 engine oil is equivalent to an SAE90 gear oil and so on. The accompanying chart will demonstrate these comparisons.

The following oils can be used with 1st class results:-

PENRITE	Shellsey SAE50 Engine oil	Specially formulated for cars built in the 1950's. No additives.
CASTROL	CRB SAE30) Engine oil 40) 50)	Straight mineral oil with no additives.
SHELL	DENTAX SAE90 Gear oil	Has an in-built anti-foam additive which is ideal for gearboxes. No other additives.

N.B. Too heavy a grade in cold climates may cause difficult gear changes until the box warms up.

My suggestion is any of the above for Australian conditions but perhaps dropping to CASTROL CRB SAE 30 or 40 engine oil for colder climates (e.g. Canada).

One reason for Laycock advising against EP and HD oils was that the epicydic gearing in the overdrive unit tended to centrifuge the oil and consequently destroy its lubricating ability.

Secondly, many modern gearbox oils have an anti-friction additive which is bad news for the clutch operation in the overdrive!

Thirdly, modern oils have a high sulphur content and thus has a detremental effect on the bronze "innards" of gearbox and overdrives. Namely, synchro rings, bearing sleeves and thrusts.

I hope all of the above may be of some help to somebody!

THE BUSH MECHANIC

Of course, the above paragraph regarding layshafts, grinding and installation of Torrington bearings applies only to four speed synchromesh boxes. (i.e. TR4 Triumph 2000-2500 etc.)

MONEY SAVING DIFF RE-BUILD TIPS FOR TR2 OWNERS .... By Peter Drummond

Such was my enthusiasm (who said stupidity?) to buy my dear old TR2, that I purchased it without so much as a test drive. I figured everything needed a rebuild, so what the hell.

On the trip home everything seemed to be functioning surprisingly well, except for the diff. The need for a diff rebuild became screamingly obvious at anything over 20 mph.

Stripping off the diff cover soon revealed the problem. A tired old crown wheel smiled toothlessly back at me, with two major molars missing.

After whipping out the entire diff unit, I reached for the phone and dialled my friendly local Moss agent. Yes he was sure $1200 plus GST would buy me a new crown wheel and pinion.

Gulp - $1200 !!! I can remember buying entire TRs for less than that, so time for a spot of research.

I trotted into the Canty library to check out a pile of well thumbed Triumph workshop manuals. After trying to get my brain around the various exploded diagrams and technical info it became clear that a Triumph 2000 or 1.5 diff was worthy of closer scrutiny...

I soon hunted down a banged up MK2 2000 sedan and for the princely sum of $35 the diff was mine... provided I removed it myself! It came out of the old dunger without too much of a struggle and I took it home for a closer look.

The strip-down produced the very crown wheel and pinion required for my TR2 - despite the fact there was almost a 20 year age difference between the TR and the MK2 2000 - why change a good thing?

Everything appeared to be in good condition so I cleaned up all the bits and took them to The Diff Shop in Christchurch. They reassembled it and replaced the various thrust washers etc.

Total cost to set up the diff was only $200 which I thought was extremely reasonable, and now my dear old TR runs nice and quiet at all speeds - well all speeds up to 90 mph. I haven't had it past 90 yet, and nether would you if you could see the slack in the font trunnions!

Cannibalising a clapped out Triumph saloon will never be cheaper, so think about adding a spare diff assembly to your spare parts cache while there are still plenty of cheap 2000/2.5s about.

An automatic will normally get you the desirable 3.7:1 diff ratio, or if you prefer a 4.1:1 ratio, wreck a manual PI and, (I think) 2500 'S' variants yield the non-standard manual for other variations and exact specs.

The parts your TR2/3/3A share with a 2000/2.5 diff include the crown wheel and pinion, the cage that holds the diff gears and crown wheel, the bearings and bearing caps and the oil seals.

I suspect these may also be good for TR4-TR6 owners, but check before you get too excited.

The 2000/2.5 diff housing and half shafts will not be any good to a TR2 owner, so either use them for a boat anchor or give them to one of those poor softies who drive TRs with wind-up windows...

This article is excerpted from TRansmission, the journal of The NEW ZEALAND TR REGISTER. Our thanks. If you have any similar useful information that you would like to share around the world, let us know & we will make you famous across the globe.

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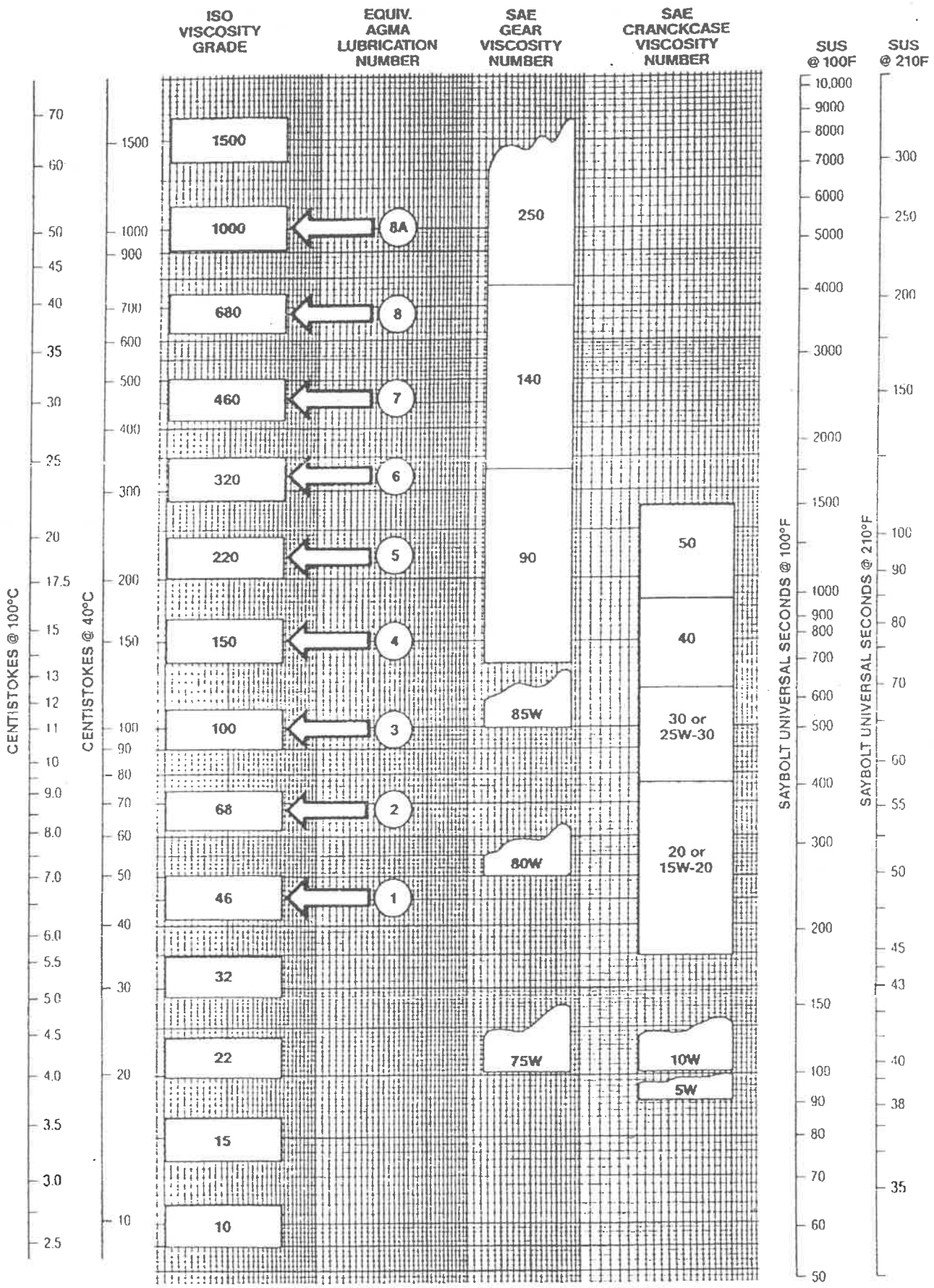
COMPARATIVE VISCOSITY CLASSIFICATIONS



VISCOSITIES AT VARIOUS TEMPERATURES ASSUME 95 VI OILS

Note. Viscosities at various temperatures are related horizontally.

SAE gear and crankcase specifications are at 100°C only.

Multigrade oil viscosities are not representative at other temperatures.

Chart courtesy of Lubrizol Corporation

PART 5

ELECTRICAL

WINDSHIELD WIPERS

DO YOURS STILL WORK ? HAVE YOU EVER CHECKED THE MOTOR BRUSH GEAR ? THOSE LITTLE SPRING LOADED PIECES OF BRASS THAT MAKE THE ELECTRIC CONTACT BETWEEN THE STATIONARY PART OF THE MOTOR AND THE ROTATING ARMATURE. WON'T LAST FOREVER ! ONCE THEY WEAR OUR , THE STEEL HOLDER CAN CHEW RIGHT THROUGH THE (VERY EXPENSIVE) ARMATURE.

CHECKING TAKES ONLY ABOUT 5 MINUTES AND IS WELL WORTH YOUR TIME , UNLESS YOU'RE LIKE SOME PEOPLE I KNOW WHO WON'T DRIVE THE CAR IF THEY THINK IT IS GOING TO RAIN. LOCATE THE WIPER MOTOR ON THE FIREWALL IMMEDIATELY TO THE RIGHT OF THE BRAKE AND CLUTCH MASTER CYLINDERS. UNPLUG THE THREE WIRES FROM THE LEFT END OF THE MOTOR , NOTING WHERE THEY GO , UNSCREW THE TWO SCREWS, ALSO FROM THE LEFT SIDE. NOW , WHILE HOLDING THE MAIN PART OF THE MOTOR WITH YOUR RIGHT HAND , PULL OFF THE END CAP WITH YOUR LEFT. VIOLA !

NOW YOU HAVE A CLEAR VIEW OF THE BRUSHES , WHAT WE ARE CONCERNED WITH IS THE THICKNESS OF BRUSH LEFT BEFORE THE HOLDER MAKES CONTACT WITH THE ARMATURE. IF THE THICKNESS AT ITS NARROWEST POINT IS AS MUCH AS 1/4" YOU PROBABLY HAVE MANY SEASONS LEFT , IF ON THE OTHER HAND ONLY A SLIVER OF THE BRUSH IS VISABLE **NOW** IS THE TIME TO CHANGE THEM.

REPLACEMENT IS SIMPLE AS THE HOLDER ARMS ARE JUST HELD IN PLACE BY THE SMALL SPRING AS SEEN IN THE ILLUSTRATION. A REPLACEMENT BRUSH GEAR SET INCLUDES THE BRUSHES, HOLDER ARMS , AND THE SPRING , AND ARE ABAILABLE FROM ASOM ELECTRIC IN BEVERLY HILLS FOR $5.87, IF YOU TELL THEM YOU'RE IN THE CLUB -- $8.76 IF YOU DON'T. MOSS MOTORS LISTS THEM IN THEIR CURRENT CATALOG FOR SLIGHTLY LESS , BUT ID DIDN'T CHECK AVAILABLITY.

WHILE YOU HAVE THE END CAP OFF THE MOTOR THIS IS A GOOD TIME TO OIL THE FLAT WASHER AROUND THE BEARING IN THE CAP , JUST A FEW DROPS SHOULD DO IT. IF YOU DIDN'T GET TO REPLACE THE BRUSHES IN TIME , DO NOT DISPAIR , IF THE HOLDERS HAVE BEGUN TO EAT YOUR ARMATURE AN ELECTRIC REBUILDER MAY BE ABLE TO REPAIR IT , IF NOT A USED ONE THAT HASN'T BEEN DAMAGED CAN BE INSERTED INTO YOUR MOTOR. DARRING THAT , MOSS MOTORS LISTS A NEW ARMATURE FOR ABOUT $60.

JOEL KLEIN - VOLUME 52 , DECEMBER 1986

CHARGE RATE

FOR MOST OF US WHO ARE STILL USING THE ORIGINAL GENERATOR/VOLTAGE REGULATOR CHARGING SYSTEM , WHAT FOLLOWS ARE A FEW GENERAL GUIDELINES ON CHARGING RATES.

THE SYSTEM ON THE TR IS A TWO-COIL REGULATION TYPE. ONE POLE (OR ELECTROMAGNETIC SWITCH) HAS NO OTHER PURPOSE THAN TO ACT AS A SWITCH BETWEEN THE BATTERY AND THE GENERATOR. IT IS DESIGNED SO THAT WHEN THE ENGINE IS SHUT OFF , IT W OPEN , PREVENTING THE CURRENT FROM RETURNING FROM THE BATTERY AND RUNNING TO GROUND IN THE GENERATOR. WHEN THE ENGINE IS STARTED , THE SWITCH CLOSES AND THE GENERATOR CAN NOW CHARGE THE BATTERY.

THIS , OF COURSE , LEAVES ALL THE CURRENT REGULATION TO THE OTHER SWITCH , WHICH CONTAINS THE GENERATOR FIELD VOLTAGE BY IMPOSING A RESISTANCE TO THE FIELD CIRCUT WHEN IT IS CLOSED , AND ALLOWING THE FIELD CIRCUT TO OPERATE WITHOUT REGULATION WHEN IT IS OPEN. IN REALITY , THE POINTS VIBRATE AND TEND TO CREATE A VOLTAGE SOMEWHERE BETWEEN THE TWO EXTREMES. IT IS , IN FACT , THE SPRING TENSION ON THIS SWITCH THAT CONTROLS THE VOLTAGE IN THE SYSTEM.

THE PROBLEM TO CONSIDER IS THAT TOO HIGH VOLTAGE WILL CAUSE THE BATTERY TO OVER-CHARGE , AND IN EXTERME CASES , CAUSING THE ELECTROLYTE WITHIN TO BOIL AND CHURN. TOO LOW VOLTAGE WILL NOT REPLACE THE AMOUNT OF BATTERY CURRENT BEING USED AND LEAD TO THE BATTERY UNTIMATELY GOING DEAD. THE PROBLEM IS ONE OF BALANCE , ENOUGH VOLTAGE TO KEEP THE BATTERY UP , YET NO SO MUCH THAT IT BEGINS TO BOIL. TO COMPLICATE THINGS FURTHER , CORRECT VOLTAGE FOR "DAYTIME" WILL CAUSE A SLIGHT DISCHARGE AT NIGHT WHEN THE LIGHTS ARE BING USED. A VOLTAGE SUFFICIENT TO PROPERLY CHARGE THE BATTERY WHILE THE ACCESSORIES ARE BEING USED WILL BOIL IT WHEN RUNNING WITHOUT THEM. THE BRITISH SPECIFICATIONS , CORRECT FOR THAT COUNTRY , WILL FRY A BATTERY IN SO.CAL. DIRVING CONDITIONS.

I HAVE FOUND THAT THE BEST COMPROMISE FOR ME IS A SETTING WHICH WILL PROVIDE A SLIGHT CHARGE DURING DAYTIME USE AND A SLIGHT DISCHARGE WITH ACCESSORIES IN USE. FORTUNATELY , MOST LUCAS REGULATORS SOLD HERE SEEM TO FUNCTION IN THIS NARROW RANGE , AND CAN BE USED WITHOUT ANY ADJUSTMENT.

HOWEVER , IF YOUR FRIENDLY REPAIR FACILITY BOLTS ON A NEW ONE AND ATTEMPTS TO ADJUST IT TO BRITISH SPECS WITH A VOLTMETER , YOU COULD END UP WITH A PROBLEM.

ONE FINAL WORD , MOST OF US ARE FAMILIAR WITH THE STEEL BATTERY BOX IN OUR CARS BEING EATEN BY ACID , BUT DON'T REALIZE THAT THIS IS A VERY GOOD INDICATION OF A BATTERY BEING OVERCHARGED AND SPITTING ACID OUT OF THE CELLS , TO BE DEPOSITED IN THE BATTERY BOX. THE REST IS HISTORY.

KEN GILLANDERS - VOLUME 87 , AUGUST 1990

RHEOSTATS

I'VE RECENTLY HEARD FROM OTHERS ABOUT RHEOSTAT PROBLEMS , WHETHER THEY BE HEATER OR LATER PANEL LIGHT SWITCHES. THE DISTURBING PART IS THE FAIRLY HIGH COST OF REPLACEMENT. SINCE THE CAR WILL SURVIVE WITHOUT THESE FEATURES , ALL ISN'T LOST , BUT SOME PURISTS OUT THERE CAN'T STAND TO HAVE ANYTHING NOT WORKING. I'VE HEARD THAT SOME PEOPLE IN THE PAST HAVE ACTUALLY USED THEIR HEATERS AT ONE TIME OR ANOTHER !

REPAIR OF THESE LITTLE BUGGERS IS THE NEXT OPTION , AND NOT A DIFFICULT ONE AT THAT. ONCE REMOVED FROM THE DASH AND THE WIRES DISCONNECTED , CAREFULLY PRISE THE METAL TABS WHICH HOLD THE COVER TO THE CERAMIC BACKPLATE OPEN. YOU WILL SEE THAT A COIL IS MOULDED INTO THIS CERAMIC BACKPLATE. USING A FINE WIRE BRUSH, CLEAN THE COIL AREA TO REMOVE ALL DIRT AND CORROSION. FINISH UP THE COIL SURFACE WITH AN INK PEN ERASER RUBBED BRISKLY OVER IT. WHILE YOU'RE AT IT , CLEAN THE WIRE CONNECTIONS ON THE OTHER SIDE , WHETHER THEY BE SPADE OR SCREW TYPE. NEXT , OBSERVE THE METAL COVER ASSEMBLY. THE "WIPER" WILL BE ATTACHED TO THE SHAFT. INSPECT THIS AREA CLOSELY , SINCE THIS IS WHERE THE PROBLEMS USUALLY HIDE. OFTEN , THE SMALL "BEAD" AREA OF THE WIPER WILL HAVE BEEN RUBBED DOWN TO THE POINT THAT IT IS NON-SERVICABLE AND WILL HAVE LOST THE TENSION TO CONTACT THE COIL AGAIN, CLEAN THESE PARTS THOROUGHLY. THE BEAD ON THE END OF THE WIPER CAN BE REPLACED BY BUILDING IT WITH SILVER SOLDER. RE-SPRING THE WIPER, LUBRICATE THE SHAFT/HOUSING AREA, CLOSE IT UP AND REINSTALL. THE SWITCH WILL FEEL LIKE NEW, AND IF YOU HAD BEEN CAREFUL, RESTORED YOUR CAR'S ELECTRICAL INTERGRITY

THE NEW WIRING HARNESS

FOR SOME TIME DIANA AND I HAVE HAD ELECTRICAL PROBLEMS WITH OUR TR3A , SOME VERY SLIGHT AND SOME MORE TROUBLESOME. THE LAST FEW MONTHS HAVE BEEN WORST. OF ALL , SOMETIMES ONE THING WORKS AND ANOTHER DOESN'T , AND THEN NOTHING WORKS ; THEN , AGAIN , IT ALL WORKS. I FINALLY DECIDED TO REPLACE THE WIRING HARNESS.

NOT BEING AN EXPERT , I WENT ABOUT THIS VERY CAREFULLY. AFTER THE NEW HARNESS ARRIVED I TOOK IT OUT OF THE BOX AND STARTED TO INDETIFY THE ENDS AS TO WHERE THEY WOULD ATTACH. WITH THE HELP OF THE WIRING DIAGRAM FROM THE OWNERS MANUAL AND THE WORKSHOP MANUAL – I GOT MOST OF IT LAID OUT.

THEN I WENT OUT AND ASKED THE CAR IF IT WAS READY BY TURNING ON THE KEY , WHEN VERY LITTLE RESPONDED , I KNEW THAT WE WERE READY FOR A MAJOR PROJECT. I OPENED THE HOOD AND LOOKED IN , THEN WENT BACK INTO THE HOUSE FOR SOME SERIOUS THOUGHT.

THE NEXT DAY AS I WALKED AROUND THE CAR I LOOKED ABOUT FOR A FEW SECONDS , THEN STARTED REMOVING THE INTERIOR (HAVING ORDERED A NEW CARPET KIT FROM CALSECO) AND THE CENTER GAUGE PANEL , WHICH WAS POWDER COATED BEFORE RE-INSTALLATION.

HERE I MUST GIVE THE PREVIOUS OWNER SOME CREDIT , HE HAD SOME INTERESTING SOLUTIONS THAT WERE THE ROOT OF THE PROBLEM , I REMOVED ALMOST SIX FEET OF EXCESS WIRE AND BAD CONNECTIONS. THEN WITH MY TRUSTY HEAVE-DUTY WIRE CUTTER/STRIPPER I STARTED TO REMOVE THE OLD HARNESS. I DID THIS BY CUTTING OUT THE CENTERS OR STRAIGHT PARTS AND LEAVING THE CONNECTIONS IN PLACE.

CLEANING AND RE-INSTALLING SUCH THINGS AS THE FUSE BOX , REGULATOR , FLASHER , AND SWITCHES WAS A MUST FOR ME , EVERYTHING WAS FILITHY.

THEN PLACED THE NEW HARNESS IN THE CAR AND ROUTED IT ALONG USING THE SAME CLIPS , THIS ALL HAS TAKEN ABOUT THREE DAYS OF SEMI-INTENSIVE LABOR. THE NEXT DAY I CONNECTED ALL THE ENDS OF THE HARNESS TO THEIR PLACES UNDER THE HOOD AND IN THE COCKPIT , EXCEPT WHERE THEY ATTACK TO THE SWITCHES AND GAUGES. I THEN REPLACED THE OIL PRESSURE LINE TO THE GAUGE, MINE HAD A LEAK.

NOW WAS ALSO THE TIME TO REPLACE THE HEATER CORE , WHICH HAD NOT BEEN WORKING FOR SOME TIME , BEFORE REFITTING THE GAUGES AND THE SWITCHES. I REMOVED THE HEATER AND REPLACED THE CORE WITH ONE I HAD GOTTEN SOMETIME AGO AND HAD CLEANED AND PRESSURE TESTED. IF YOU ARE DOING THIS , CHECK WITH THE WORKSHOP MANUAL TO SEE HOW THE WATER HOSES ARE ATTACHED, AND DON'T MAKE THE MISTAKE I DID AND HAVE TO TAKE IT OUT TWICE.

CONNECTING THE REAR PORTION OF THE HARNESS WAS A LOT EASIER AND SOON ALL THE LIGHTS AND TURN SIGNALS WERE CONNECTED.

BEHIND THE GAUGE CLUSTER PANEL I WORKED MOST CAREFULLY , TRYING NOT TO MAKE THE SAME MISTAKES AS THE PREVIOUS OWNER , AND FINALLY FINISHED WITH THE INSTALLATION OF THE NEW HARNESS.

NEXT CAME THE TESTING. WITH THE LOAN OF A CONTINUITY TESTER AND A TEST LIGHT, DARRYL CLARK AND I CHECKED SOME THINGS OVER AND CONNECTED POWER TO THE SYSTEM.

BY LEAVING THE OLD CONNECTIONS IN PLACE , I FEEL THAT I HAD AN EASIER TINE DOING IT RIGHT , WITH FEWER MISTAKES. TO REALLY FINISH THE PROJECT I PURCHASED A COMPLETE CONTROL HEAD AND ASKED MARTY LODAWER TO HELP ME CLEAN AND CHECK IT OUT, SINCE HE HAD JUST DONE THE ONE FOR HIS 1800 ROADSTER. WITH HIS EXPERT HELP IT WAS COMPLETED IN ONE DAY AND ALL I HAD TO DO WAS RE-WRAP THE WIRES AND PUT THEM DOWN THE TUBE AND CONNECT THEN TO THE HARNESS IN THE ENGINE COMPARTMENT. I USED AN OLD HANGER TO CLEAN OUT THE TUBE, SLID THE WIRES DOWN AND CONNECTED THE CONTROL HEAD TO THE STEERING WHEEL. KNOWING THAT THE WIRES WERE GOOD AND THE HARNESS NEW , I MADE THE CONNECTIONS AND EVERYTHING WORKED.

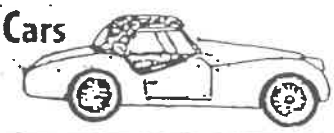
FOR TWO WEEKS OUR CAR WAS OFF THE ROAD , BUT NOW IT IS A BETTER CAR AND A BETTER LOOKING FOR THE WIRES ARE IN THEIR PROPER PLACE AND THE NEW CARPET KIT WORKED OUT GREAT WITH JUST A LITTLE BIT OF ALTERATION.SO , TO END , LET ME SAY THAT THIS IS A PROJECT THAT CAN BE DONE IF YOU DEVISE A PLAN AND STICK TO IT , AND THERE ARE PLENTY OF US OUT HERE WILLING TO HELP.

AN EXCERPT FROM THE

J.Z. WITLESS & CO.

CATALOG OF PARTS AND ACCESSORIES FOR

Imported Sports Cars



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FOR IMPORTED CARS

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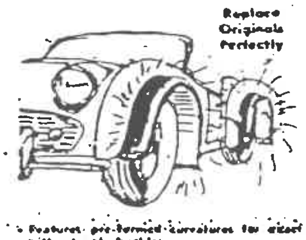
New! DISHWASHER SAFE for 1980

Year & Model	Stk. No.	1-Set
AUSTIN		
7-67 A40 [illegible]	89-0948U	$24.98
4-59 A30 A35	89-0950P	19.98
9-Sept 62 A40 Farina MK [illegible]	89-0950P	19.98
AUSTIN-HEALEY		
4-67 [illegible] Sprite	89-0948U	24.98
8-Sept 67 Sprite MK [illegible] 948cc	89-0950P	19.98
62-75 Sprite [illegible]	89-2723R	19.98
DATSUN		
5-72 520, [illegible] Pickup	88-5115W	11.98
FIAT		
7-73 [illegible] 600D [illegible]	89-0937M	7.98
1-71 500, Bianchina [illegible] Nuova	89-2917X	4.98
HILLMAN		
7-57 Husky Series [illegible] Minx	89-0952W	4.49
7-63 Husky Series [illegible] Minx	89-0964R	5.98
MERCEDES		
1-62 180 [illegible]	89-0955R	19.98
1-75 All with [illegible] bolts	88-0075R	46.49
MG		
7-67 Magnette [illegible]	89-0948U	24.98
Sept 62 Midget 948cc	89-0950P	19.98
[illegible] 75 [illegible] 1098 [illegible]	89-2723R	19.98
1-78 MGB [illegible]	88-0074E	37.98
PEUGEOT		
67 403	88-6601P	14.98
VOLKSWAGEN & KARMANN GHIA		
-65 1200 Models	89-0484Y	3.95
VOLVO		
66 PV444 [illegible] PV445 PV544	89-0959A	10.49

Non-buckling pre-formed Rubber FENDER FLARES

Replace Originals Perfectly



- Features pre-formed curvatures for exact fit without ugly buckles
- Made of super-tough, space-age synthetic rubber . . . custom formed for easy installation and exact fit
- Add smooth, custom contour to your TR. Since Mark flares widen fenders 3" for a neat look around wide tires. Also deflect mud, dirt, gravel and corrosive salt to help keep your body finish looking good. Extra strong, heavy-duty

TR2 and TR3. . . . . Each $17.95

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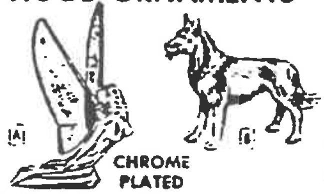

CHROME PLATED

Our best selling ornaments each die cast then beautifully chrome plated. Easy 2-stud mount on hood or fender.

[A] ILLUMINATED FLYING GODDESS. Colored plastic wings light. Connects to head or dash lights. [illegible] 12 volt with bulbs, wiring.

12-1998P—Green 12-2000U—Blue
12-1999Y—Red 12-2001B—Amber
Each $9.39

[B] ILLUMINATED DOG. Eyes light up. [illegible] long x 3" high. Connects to head dash lights. With bulb, wiring. For 56-62 MGA.

Beautifully chrome plated [illegible] engine. Fit front or rear.

17-8237A—12 volt
17-8238B—6 volt . . . Ea. $7.98

Above, but not illuminated
17-8236T— . . . Each $3.29

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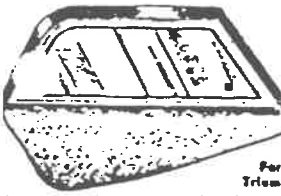

For Triumph

Non-perforated to assure complete night-time privacy . . . any time of day. Velcro® fasteners let you install or remove curtains in seconds. New lightweight wraparound keeps the interior of your vehicle cooler, more comfortable and keeps out prying eyes for total privacy. Super-soft gold color vinyl is good looking, durable and easy to clean. Velcro® fasteners assure quick installation and removal—no tools required. Full 10F" x 28" to provide adequate coverage. Complete with instructions.
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Signals Cars Behind You

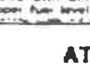
RED EYES FLASH WARNING

Stop or Slow — Right Turn — Left Turn

Soft fluffy . . . and safe! Lovable looking stuffed cat has acrylic fur and satin bow. Sits on rear window ledge. Automatic operation—hooks up easily to directional wiring. Eyes light up when brakes are applied, blink on and off with directional signals. 17" long. With instructions. For all cars.
16-0106X— . . . Each $7.98

Red Replacement Bulbs for Winky
74-6067U— . . . Pkg. of 2 99c

Improved RESONATORS for all S.U. CARBURETORS



Improves fuel economy and performance. Improves carburetor life. Replace worn, defective float valve with improved Float valve. Maintains proper fuel level

The "HOT" set up for competition, rallying or road use

Engine-to-Transmission ADAPTERS

Get More Horsepower, Faster Acceleration, Higher Top Speed! . . . Install a Larger, More Powerful Engine In Your Car

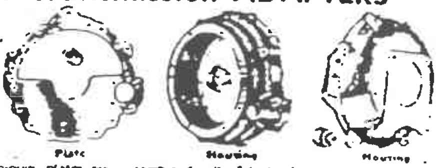


Plate — Housing — Housing

[illegible] are heat treated aluminum plates are heat treated aluminum or steel. Pilot bearings or bushing adapters included where necessary. Choice of adapter housings with or without rear steel mounting plates. Mounting plates simplify installation even more—add extra support strength and rigidity. To find correct adapter in chart below, read down to find engine, then across to find car or transmission that engine is to be combined with. Fit standard transmissions only (not for automatic transmissions). Cars are Made [illegible] Adapters with [illegible] shipped from California. Average Shipping weight [illegible] lbs. w/o Plate 22 lbs. w/Plate. State Make, Year, Model and Cu. In. Displacement of Engine—Also State Make, Year, Model of Car or Truck, Type of Standard Transmission and Stock No.

ADAPTS THESE ENGINES TO FIT THESE STANDARD TRANSMISSIONS

IMPORTANT SEE NOTE ◆

	Note	AUSTIN 47-54 A40 AR; 55-60 A30, A35, A4C Farina; 57-61 A50, A55 Cambridge; 61-67 A40 Farina MK II; 63-66 A40 MKII; 7-1/4" Clutch — Stk. No.	Each	BORGWARD [illegible]; CITROEN [illegible]; MORRIS [illegible] — Stk. No.	Each	TRIUMPH 50-53 Mayflower; 52-64 TR2, 3, 3A, 4; 59-60 Herald TK.C 948CC; 62-66 Herald 1200 [illegible]; 63-67 TR4A — Stk. No.	Each
BUICK & SPECIAL							
61-63 V6 & 215 cu. in. V8		87-3365P	$38.98	—	—	87-5066B	105.98
64-73 V6 300, 340, 430 V8's		—	—	—	—	85-0946B	164.98
CHEVROLET V8							
55-61	◆(1)	85-2722U	41.98	87-5631T	99.98	87-5062A	91.98
55-61	◆(2)	85-0944X	99.98	99-0400WT	104.95	85-1625A	88.91
62-76	◆(3)	85-0948Y	64.98	99-0401UF	109.98	85-0947P	99.98
FORD & MERCURY V8							
54-64 239, 256, 272, 292, 312		85-2735X	53.98	87-5654H	89.95	87-5064X	89.95
FORD, MERCURY & LINCOLN V8							
332 thru 430 cu. in. exc. 429 and 62-76 Lincoln	◆(4)	85-2743A	64.98	87-5655B	124.98	79-5367UF	89.95
FORD V8							
62-64 221, 260, 289	◆(5)	87-3501T	34.98	87-5656P	99.98	87-5065U	91.98
FORD, FAIRLANE							
65-76 289, 302, 351 V8 and 65-76 240, 300 6 cyl	◆(6)	87-3502W	32.58	87-5637Y	104.98	87-5636B	104.98
OLDSMOBILE							
61-63 V6 and 215 V8		87-3365P	38.98	—	—	87-5066B	95.98
65-76 330, 350, 400, 425		87-3530X	37.96	79-6602UF	112.98	79-6628T1	82.49
PONTIAC & TEMPEST							
61-63 215 V8		87-3365P	38.98	—	—	87-5066B	95.98
61-76 326, 389, 400, 421	◆(7)	87-2805W	64.98	87-5669T	104.98	79-5319A1	88.95

SPECIAL NOTES FOR ABOVE

1. Must use powerglide housing #3751080 on engine to retain stock starter mounting. Must use 56-61 starter and flywheel.
2. Bolts to block. Must use 55-61 Starter and flywheel.
3. Adapter bolts to block. Must use 1962 and up V8 starter and flywheel.
4. 1965 and up engine must use same year starter and flywheel.
5. Adapter also fits Ford V8 truck incl. engine with 5-bolt housing.
6. Adapter also fits Mustang 289 [illegible] but must use Fairlane 4-speed flywheel C5OZ-6375-B starter C5TZ-11002-A and starter plate C5DZ-7007-A.
7. Must use 61-64 Pontiac starter [illegible]

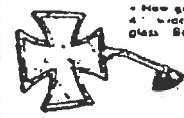
PINION & RING GEAR SETS — FOR IMPORTED CARS —SEE INDEX

Sensitive Mechanic's STETHOSCOPE

Quickly detects any noise in engine — bearing knocks, piston slap, noisy valves, rear end, body squeaks, distributor bearing, air and vacuum leaks, water pump squeaks. Extra long reach makes for easier use.
74-6916B Each $4.98

DON'T ORDER THIS UNLESS YOU ARE VERY SENSITIVE

MALTESE CROSS MIRROR



• Now get that chopper look. 4" wide mirror with [illegible] glass. Black wrinkle-finished metal [illegible] 6" extension arm with fully adjustable bracket.

Year	Model	Stk. No.	1-Pair
53-56	Austin-Healey	79-5608AF	$86.99
57-63	Austin-Healey	79-5609BT	88.99
56-63	Austin-Healey Sprite	79-5610XF	80.99
56-63	MGA	79-5611HF	80.99
54-63	Triumph TR2 and 3 Regular Spring-button Type (See ordering information)	79-9187BF	113.99
54-63	Triumph TR2 and 3 Wedge Type (See ordering information)	79-9188PF	113.99

State Make, Year, Model of Car and Stock No.

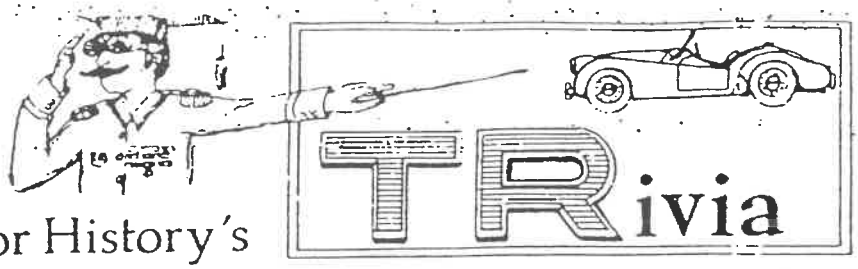
ORDER BLANK

#	QTY.	CAN YOU DESCRIBE	EACH	TOTAL

SPECIAL COUPON

ATTACH THIS VALUABLE COUPON TO YOUR ORDER BLANK !!
GET A FREE KEY-CHAIN AND ADD 30% TO THE COST OF THE ORDER!

A SATIRE BY STEVE & MARTIN (EXCUUUUUUSE US!)



Major History's

INTRODUCTION

During the nine year production run of the TR-2/3 series many changes and improvements were made to the cars by Triumph as lessons were learned from competition and everyday use. These changes were made continuously during production, not by calendar year, so it can sometimes be difficult for an owner who is restoring the car to know exactly what equipment would have been on it originally. (unless he or she bought it new!)

This series of articles will attempt to show at what Commission (chassis) number a given change took place. It should be noted however, that factory data is not always 100% accurate and some unusual discrepancies and hair-raising exceptions have been observed. Therefore, the number should be used mainly as a guide and it is wise to allow a margin of several hundred cars in either direction from the Commission number where a given change supposedly took place. This is especially true of body and trim changes-the mechanical ones were usually more definite.

Here is a quick review of the cars by Commission number:

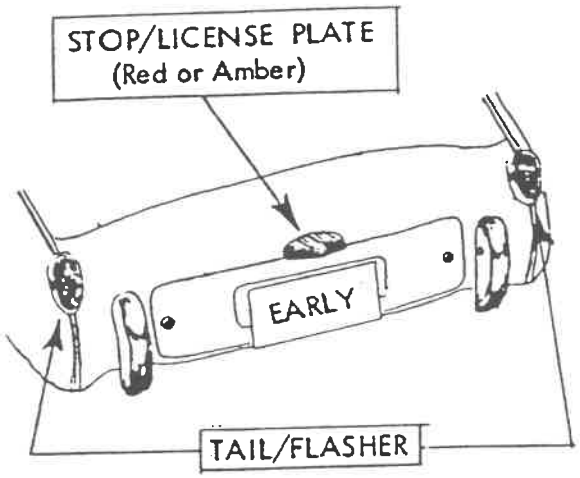
TR-2	TS1 - TS8636	
TR-3	TS8637 - TS22013	(smallmouth)
TR-3A	TS22014 - TS82346	
TR-3B	TSF1 - TSF530	(identical to 3A)
	TCF1 - TCF2804	(TR-4 engine & trans)

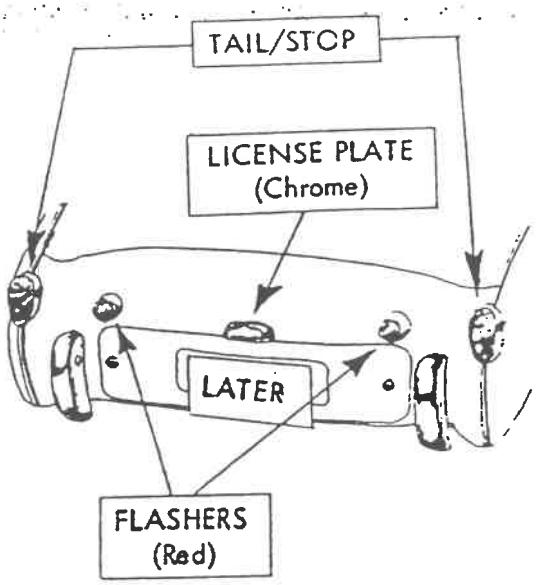
And now, on to today's topic:
THE REAR LIGHTING SYSTEM

Two different rear lighting set-ups were used on the TRs and they are shown in the illustrations. According to the Factory Spare Parts Catalogue, the change took place at Comm. No. TS 15601 for cars exported to the U.S.A., Holland, and Belgium only. It is not stated when the British cars changed over but they likely kept the early system until the last of the TR-3s.(TS 22013) One of those discrepancies shows up, however, as the chrome license plate lamp (which should have been added at the same time) is listed as starting at a later number: TS 18913. This could have been where the British cars changed over. If not, so much for factory data! At any rate all the cars I have seen so far seem to support the change at TS 15601, which would be on TR-3s beginning around February 1957.

The lower illustration shows the slightly smaller and more squared-off tail light lens used on the first 1300 TR-2s with many of them having the small round reflector stuck on below it. Beginning at TS 1301, the lens was the same for the rest of the series.

Marty Lodawer
Newsletter #1

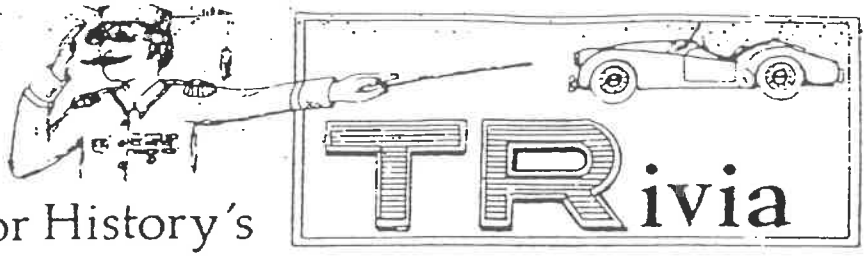




TS1-1300

REFLECTOR

TS1301-ON



Major History's

TODAY'S TOPIC: Starters (the long and short of it)

There were two types of starter motors used on the TR-2 ar TR-3 series and here we'll have a look at the differences betwe them, and also some related parts that were changed along with.

The first type of starter was used on the TR-2, the TR-3, TR-3A up to commission number TS 50000. It is often called the "long type" because it extends 2½" further forward when mounted the engine. It has a 9-tooth pinion which moves rearward to en gage the flywheel ring gear and turn the engine over. The driv from the motor portion to the pinion is transmitted by a specia sleeve made up of two concentric steel tubes; a rubber-coated inner fitting tightly inside the outer. Unfortunately, this assembly has a cute trick of wearing out rather frequently resulting in the pinion not moving back to engage the engine, even though the motor is spinning. You'll know it right away if thi happens to you...you push the starter button and the thing just sits there going "whizzzzz" without turning the engine at all. That means it's time to replace the sleeve assembly with a new one. (Lucas Part no. 291585)

Probably fed up with customer complaints about slipping starters, Triumph came up with a new one in 1959 and introduced it on the TR-3A at commission number TS 50001. This has become known as the "short type" because of its shorter casing. The troublesome sleeve assembly was gone, and in its place was an external pinion drive featuring a big spring and shaft sticking out of the back. A slightly larger pinion with 10 teeth was mounted on this shaft, and now when the starter was activated, the spring pushed the pinion FORWARD to engage the engine. This was a much more reliable system, and had the added benefit of being much quieter in operation than the early one. This starter was used in the rest of the TR-3A/3B series and in the TR-4 and 4A as well.

When the new starter was introduced at TS 50001, several other components were changed as a result. They are:

FLYWHEEL and RING GEAR. Cars with the early starter had a ring gear that was pressed on to the flywheel (after being heated). When the starter was changed, a new and heavier flywheel was used, and this one had a ring gear that was held on with six bolts. This is the easiest way to tell them apart.

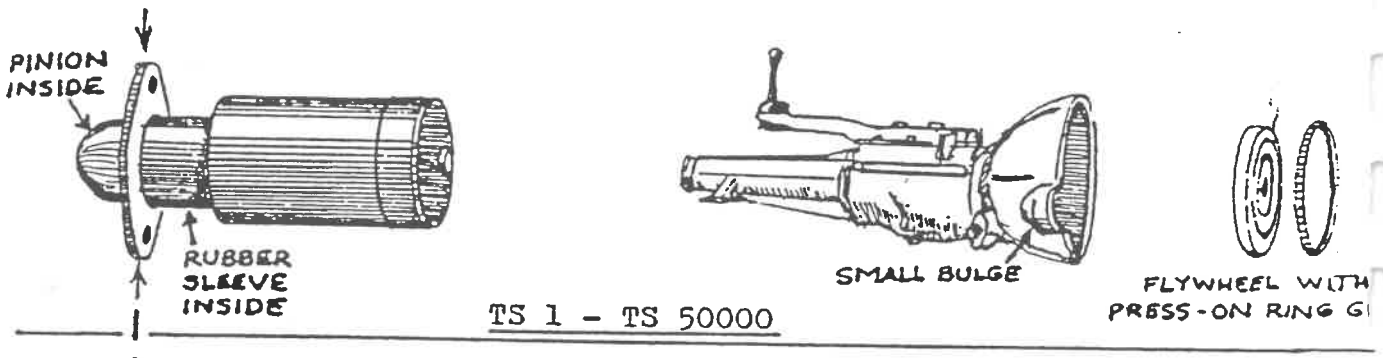
TRANSMISSION BELLHOUSING. Looking at the trans casing from inside the car, there is a small bulge on the right side, behind where the starter bolts onto the engine, to accomodate the rear portion of the starter where the pinion is. The later starter with its long spring unit at the back went in too far to clear, so the bulge on the bellhousing was made larger and more square to give the needed clearance. The gearbox itself was not changed.

TRANSMISSION TUNNEL. This now had to be reshaped slightly to fit over the larger bulge in the bellhousing. The bolt holes still aligned the same way, though. The nice thing about the later tunnel is that it fits over a TR-4 gearbox without any modifications if you're looking to install one. As Ken says, the early tunnel has to be pounded on a bit to go over a TR-4 trans. which has a large starter bulge like that in the post-TS 50000 TR-3A's and B's.

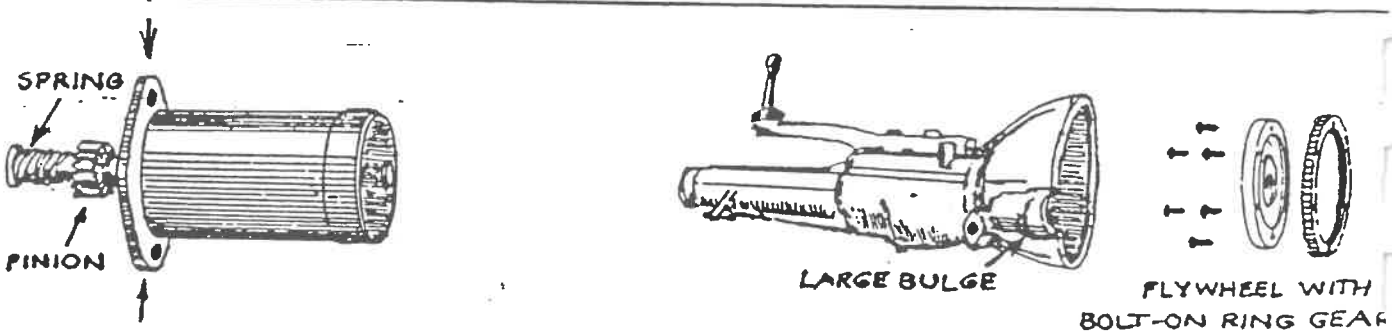
That's the way it was from Triumph. Over the years, many hybrids have been created. The early long starters were (and still are) more difficult to come by than the late ones, which are better anyway, and many pre-TS 50000 cars have been converted over. This is easy to do if your early car has been fitted with a late trans - you need only swap the starter and flywheel for the late ones. If the original trans is still there, you're pretty much out of luck unless you want to bore a hole in the bellhousing to let the spring through... not recommended. Sometimes things get real interesting. Upon disassembling the drive train in my 1957 TR-3 for rebuilding, we found that it had the late flywheel, but was still fitted with the correct early starter. While it may be possible for that combination to work, I'll bet it must have sounded just swell when it was operating! Needless to say, a proper early flywheel was installed during the rebuild.

So there you have it. It's just a good idea to check and see exactly what is in your car before you buy any replacement parts.

Martin Lodawer



TS 1 - TS 50000



TS 50001 onward

ELECTRICAL SYSTEM FAILURE REPORT

So there I was, motoring along fine as you please, when I turn into the post office to make a quick delivery. I was inside f all of one minute, then returned to the car to continue my rou Turn the key on...hey...wha'ppened to the warning light? Pres the starter button...zilch. Not even a click. Try the lights horn, wipers, power ash tray--alles kaputt! The entire electr cal system had deactivated itself! I grapped the coach key an got out...they couldn't possibly have stolen the battery in on minute...no, it's still there with all connections properly ti That's just SWELL! It's after 10 P.M., and here am I, miles f home, all alone with Karl Malden's voice ringing in my ears: "What WILL you do??"

This complete shut-down of the electrical system seems catas-trophic when it happens, but if you have a clue as to where to look for the fault, you may well be able to fix it yourself qu easily. I was lucky in that I had such clue, thanks to anothe club member (who will be granted anonymity to protect the repu ation of his TR) who had exactly the same thing happen a few weeks before and told me the cause.

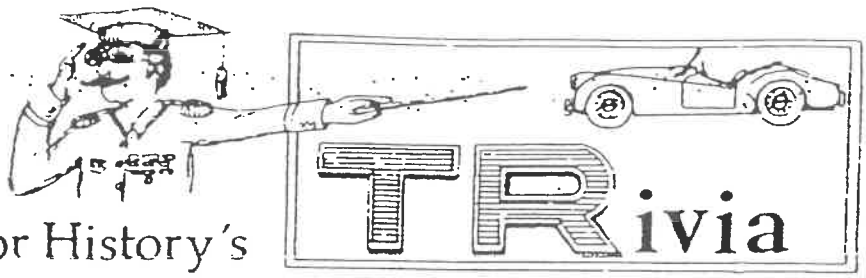
In both cases, one of the wires connected to the ammeter on the dash had come loose. These wires are live, carrying the batte current at all times, and disconnecting one of them will effect a complete electrical shut-down (and possible sever damage if t wire contacts a metal surfact under the dash where it can short out. It is bes to disconnect the battery by removing the grou cable before you start fumbling around under the dash. By care fully feeling the wires behind the ammeter I was able to find t one which had popped out, and by gingerly loosening theammeter bracket behind the panel, withdraw the gauge far enough from it to re-connect the offending wire.

Then I carefully replaced the gauge in the panel, taking care o the mass of wiring back there, re-connected the battery cable a WOW! Electrical system at full health once again! The whole episode took fifteen minutes and I was on my way.

A couple of additional notes: If you should experience this pr blem, yet find the ammeter connections in good order, you shoul examine the connections at the other ends. From the ammeter, o wire (original color brown with white stripe) goes to the "A" terminal on the fuse box below the regulator. Thses wires are easy to spot as they are much thicker than nearly all others. If one of them comes loose here, you'll have the same electrica system failure. Aoo of these connections should be checked periodically for tightness and cleanliness. Just remember to disconnect the battery while you're playing around with them.

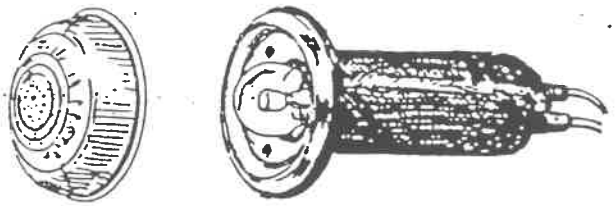
This may not be a very common problem for most TR drivers, but the knowledge of someone else's experience made all the differ-ence fore me between solving the problem quickly, or abandoning the car for a long walk home. If this bit of information helps just one of you someday it will be well worth it!

Marty Lodawer
Newsletter #31



All TR-2

TR-3 up to Comm. No. TS 17340



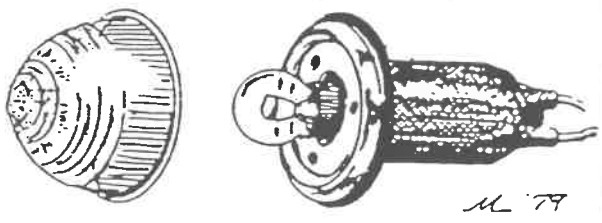
THE FRONT TURN SIGNAL LAMPS

Two different front signal lamps were used on the TRs and they are shown below. The flat glass lens and long lamp began with the TR2 and was continued on the TR3 (smallmouth) up to Commission Number TS 17340. Beginning at TS 17341, a shorter lamp with a domeshaped lens was used and that was tetained on the TR3A and 3B until the end of the series.

If you have an early car which has the dome lenses and you wish to replace them with the correct flat ones, you'll need to check and see which lamp is fitted, as the flat glass will not fit on the later short lamp because the bulb protrudes too far. In that case it will be necessary to get new lamps as well. However, the dome lens can be used on the early long lamp with no problem at all.

TR-3 from TS 17341 onward

All TR-3A and TR-3B



Marty Lodawer
Newsletter #2

IGNITION TIMING

Ignition timing is a poorly understood, very important and a frequently done wrong portion of a tuneup. While most distributors are designed to be timed with a strobe or electric timing light and running, the TR distributor is designed to be timed with a static light and with the engine stopped. If a TR 2 or TR 3 is timed with a strobe and while running, all you will get for your trouble is a poor running engine with badly retarded ignition timing.

What follows is the factory timing method and it seems to work best.

First, remove the coil to distributor low tension lead at the distributor, usually located in the distributor base and next to the cylinder head.

Second, connect a static light between the distributor terminal and a convenient hot lead (the battery will do).

Third, using the crank if you have one or by pulling the fan around in a clockwise direction as viewed from the front, place the hole bored in the back half of the pulley 3/8" to the left of pointer which is attached to the timing chain cover, do not back up in a counter clockwise direction, as the crank shaft motion is not directly transmitted to the camshaft because of the continuous movement clockwise to the correct location, which is with the hold about 3/8" to the left of the pointer.

Fourth, loosen the clamp at the base of the distributor and very slowly turn the distributor in a counter clockwise direction until the static light comes on and then back in a clockwise direction until the light just goes out. This is the exact point of ignition and it is possible that the light may come on as you tighten up the clamp, making it necessary to readjust until thelight just goes out. Then reconnect the low tension leand and you are ready to go.

3/8" measured on the circumfrence of the crankshaft pulley is about 8°, which is more initial timing advance that the factory recommends, the engine however, seems to run more effectively at 8° advance that at 4° advance.

Ken Gillanders
Newsletter #6
Reprinted in #28

STARTER SOLUTION

As some of you might already know, Daryl Uprichard of the TR Register England and I have been enchanging technical information for some time. In our las tape exchange Daryl told me about a novel and very effective solution to starter and starting problems.

In England where the weather is often very cold and where starting becomes a problem, they have taken to installing TR-6 starters.

First the TR-6 ring gear is an exchange fit on a TR-3 flywheel and then while they have the engine block out they machine .125 in. off the face of the block where the starter mounts. This repositions the starter pinion to the correct depth in the flywheel ring gear. Next they run the primary battery cable from the battery positive terminal directly to the solonoid terminal on the starter itself and remove the original solonoid. This might not be the answer for everybody but the much stronger starter motor and much more favorable gear ratio will really spin the motor over.

Ken Gillanders
Newsletter #34

GENERATORS

One of the more distressing things that can happen to the hapless TR owner is to lift the hood to see why the generator is no longer charging, and find that pathetic Lucas product thrashing about the engine compartment with no visible means of support. The cause is usually one of the three listed below, or, if you're really lucky, all three of them!

1. The bolt from the rear mount is missing. This usually allows the generator to vibrate enough to eventually permit the next two causes to occur. Solution: get a 5/16 NF bolt about 1½" long, preferably with a 5/16" diameter shoulder about 5/16" to 3/8" long next to the head. With this bolt placed through the rear generator mount and bracket, put a new 5/16" split lock washer over the end, followed by either a self-locking nut (elastic type) or a standard 5/16" NF nut jambed with a second one. If you use the standard nuts however, be sure to hold the one next to the lock washer with one wrench while tightening the other nut with another wrench.

2. Front bolt missing, and sometimes front generator mount (aluminum) broken off. Obviously, if the mount is broken, you are looking for another generator, but in order to prevent the loss of the bolt and repeated breakings of the front mount, the solution is to secure a 5/16" NF bolt 1¼" long, clean the threads of the bolt (as well as the internal threads of the front mount anchor) with lacquer thinner or Loctite primer and install, along with a new split lock washer. Threads can be treated with stud mount-grade Loctite or similar chemical bolt lock product.

3. Bracket bolts missing (usually accompanied by severe oil leak at the front of the engine). There are three 5/16" bolts which hold the generator bracket to the engine block on the right side of the engine at the front. On some engine blocks, two of these bolts communicate directly with the interior of the crankcase, and on others, all three do this. Obviously, if any of these bolts fall out, you have an open hole right into the crankcase and a monumental oil leak! This whole thing is complicated by the fact that it is almost impossible to use Loctite on these bolts because of the oil. Solution: you may use three 5/16" NC 1" long bolts from a TR transmission front cover (these already have the heads drilled for safety wire), or use the existing bolts after drilling the heads as shown with a 1/8" drill bit. Next, coat the threads with with gasket sealant, install in the bracket, then wire the heads together by running safety wire through the hole in each bolt and tying them together.

One other generator problem is one of simple maintenance which is often neglected. The rear bearing on the TR generator is an Oilite bronze bushing which is to be lubricated occaisionally and sparingly through a small hole in the center of the rear plate. This is easy to do and takes only a drop or two of motor oil from an oil can every 2500 miles or so to do the trick. However, from what we have seen, these bushings are never oiled in many cases, leading to failure. Remember, though, it's equally easy to oil the bushing too much, which causes the oil to be deposited on the commutator end of the armature and may cause the generator to stop charging. A little oil goes a long way!

Ken Gillanders

W A R N I N G ! !

T R .... Electrical wiring ... Did you know that the side/tail lights, the headlights & the overdrive are NOT on fused circuits. I wondered why my original harness was burnt, and now , sadly, my brand new one has been damaged by a simple short circuit in a sidelight. These lights are so exposed to accidental breakage that wiring damage can easily occur.

A short circuit on the overdrive could quickly ruin a very expensive solenoid.

SOLUTION : An inline 10amp fuse on each line tucked up under the dash.

Headlights are quite often direct connected but a circuit breaker to each headlight could be a solution.

Russell Holliday.

STARTER

GIVE YOUR STARTER ALL THE BREAKS. This means good cables, clean connections and tightened properly. Ensure there is a ground cable from the distributor side and attached to the front engine mounting plate.

Other than the rubber torque unit, very little can ever to wrong with the starter. You will, of course, need to change brushes occassionally and also look at the bearings. That rubber part is difficult to install to put it mildly and they are on the "very scarce list" at this time. A tool you can make in the form of a notched tube and a suitable press (I use a lathe for this) and a butchered screwdriver will let you get the job done. The armature should have no more that .020" of end float. Shims applied to the rear part of the shaft will keep that under control. The armature should also be turned on a lathe and polished so the brushes don't bounce all over the place.

It's been said, "Give the Starter a Break". Even though the originality 'nuts' will throw rocks at me, the installation of an electric fuel pump will go far in saving your starter motor. Now what has a fuel pump to do with saving a starter? Simple, in especially hot weather the carb float bowls will evaporate and with a mechanicial fuel pump you must fill the bowls by cranking the engine, whereas the electric pump begins filling the bowls the moment you turn on the ignition. This installation will cut your starter cranking time by at least 75%, resulting in a comparable increase in the life of of the rubber unit in the earlier starter drive units. An AC, 6psi pump with an adjustable regulator makes a good installation and is readily available. Set the regulator to 2-3psi for good results. This rig fits nicely on the left inner fender well, just above where the mechanical pump perches, and requires a minimum if line changes.

(A word of caution) Don't leave the old pump on the engine! Cover the hole the pump leaves with an aluminium plate at least 1/4 inch think. You can use the gasket for a template to cut the plate to fit. Pumps running dry soon disintregrate and then pump engine oil out onto the ground. You want to leave street oiling to the highway department.

GENERATOR

The method of mounting the generator is one of the most troublesome of TR troubles. Sooner of later the beast will hula itself right off the into space and in the process chew up everything in sight. It will break the end bracket, elongate every hole and then have that special front fitting for desert. The three screws that hold the bracket to the block are drilled through into the innards of the engine. The loss of one of these leads to dumping all the oil onto the street with disastrous effects on the engine bearings. So, first drill holes in their little heads and lockwire these three bolts. The holes in the generator end bracket can be drilled out to accept three/eights bolts and these are stronger anyway. Use only 'Grade 8' nuts and bolts. Lean on them pretty hard when assembling. The special fitting can be welded to replace the worn out metal and rethreaded. The hole in the engine front plate can only be repaired when the plate is off the engine.

The rear end of the generator lives in a hell-like cave, right next to the exhaust pipe and some consideration should be given to a heat shield between these two components and the addition of an oil groove in the rear end plate bushing also helps. Neither is it advisable to block the gap between the right side of the radiator and the inner fender as this passage admits considerable cooling air to the generator.

The "U" bracket is another potential disaster item. The three bolts holding it to the block are drilled through to the innards and are exposed to the oil splashing around in the #1 cylinder. They have been known to loosen and vibrate clear out and then again oil is free to fly out of the hole. This will empty the crankcase and in a very short time lead to disastrous bearing failure and breakup of the entire engine. It is best to drill and lockwire the heads of these bolts and coat the threads with Aviation Permetex when enstallilng them. Then lock wire the three heads together, avaition style.

B. S.

14.

GENERATOR CONVERSION TO AN ALTERNATOR

Some time ago the VTR publication had an article on changing the charging system to a readily available alternator, hereby adding much reliability to the system. We are aware of the shortcomings of the Lucas generator and this seems to be quite a desireable way to go.

Now the originality people will again throw rocks at us for advocating such heresy, but it has much to be said for it. Remember, even Triumph went to alternators long before the end of the TR production. The original VTR article has been revised into a more understandable format of 'step by step' as to how to modify the electrical system. Our resident juice expert wrote this bit and created the writing diagram of the complete system that anyone can follow. Ed Deering has installed this modification of several TR's and was the first advocate that I know of who readily saw the merits of this change.
Here are several reasons for considering this modification:

a. The proximity of the rear bearing to the exhaust manifold has always created failure of the rear bearing.
b. The generating capacity of an alternator is almost twice that of an generator.
c. The cost of an alternator is less than that of a rebuilt generator.
d. The companion regulator is less costly than that of a Lucas regulator.
e. The selected alternator is available in parts stores on every stre[illegible] corner across the USA.
f. Alternators are far more reliable than generators.

No current automobile manfacturers have had generators on their cars in more than a decade.

Mounting the alternator has one tricky feature in that of the pulley change since the alternator has an oddball diameter shaft and it is necessary to bore out the hole in the Lucas pulley to fit the alternator.

We have had to bore the pulleys on a lathe to this nonstandard size, but discovered that a keyway is not necessary to secure the pulley to the shaft. The nut and spring washer off the alternator are sufficient. Also, the original bracket must be slightly notched on the front ear to allow the alternator to swing up to the minimum belt length position. No changes (mechanically) are required to the remainder of the belt system. A longer belt (Gates 308) is necessary.

ALTERNATOR INSTALLION INSTRUCTIONS
FOR A TR-3*
Revised

(step by step)
*Use the same gauge wire as originally used for these connections.

1. Remove Lucas generator and control box, taking care not to damage the wires.

2. Install Ford alternator and regulator.

3. Install an 8-position barrier type screw terminal strip in a convenient location near the regulator. Number the strip from left to right. The strip will be referred to as 'TB' in the following steps, e.g., TB-3. This is the third terminal from the left.

4. Connect ternimal TB-3, TB-4 and TB-5 together using a jumper.

5. Connect the small yellow/green wire as follows:
   Lower end connects to alterna- tor "FLD" terminal.
   Upper end connects to TB-1.

6. Connect a new (preferably yellow/green) wire from TB-1 to the "F" terminal of the regulator.

145 7. Connect the large yellow wire as follows:
   Lower end connects to alternator "BAT" terminal.

8. Connect a large (preferably yellow) wire from TB-3 to the "A" terminal on the regulator.

9. Connect the brown/white wire from the wiring harness to TB-4. This wire goes to the ammeter.

10. Connect the brown/blue wire from the wiring harness to TB-5. This wire goes to the ignition and headlight switches.

11. Add a new wire (your choice of color) from TB-6 to the "S" terminal on the regulator.

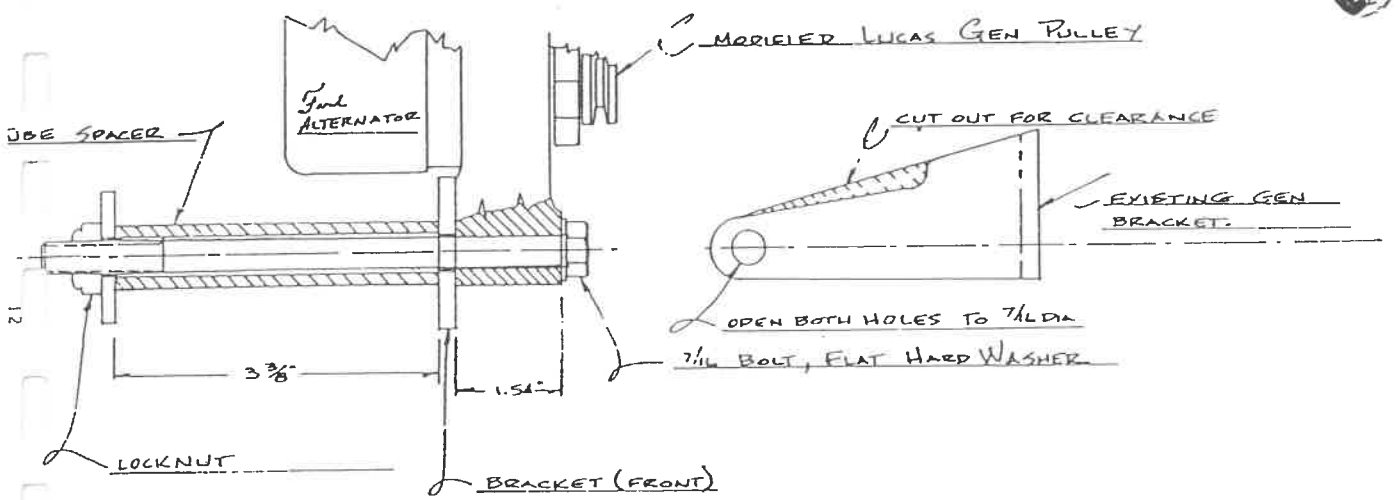
12. Add a new wire (your choice of color) from TB-6 to the "A4" terminal of the Lucas fuse unit. The other wires attached to "A4" will be green.

13. Connect a new wire from the "GND" terminal of the alternator to ground.

14. Connect a new wire from the "G" terminal of the regulator to the ground.

15. Reverse COIL wires.

16. The electrical installation is now complete.



The above article was written by Bob Schaller of Phoenix Arizona USA.Our thanks.

Using Unleaded Fuel in Leaded Fuel Engines.

om "Engineering Bulletin", August 1993, issued by ACL utomotive Components Limited). Written by Nigel C Tait, ni Engineer.

Very few pre-1986 vehicles could operate on unleaded 91 tane fuel without modification.

ost engines would require a reduction of compression io and the fitting of valve seat inserts.

n headed engines originally designed for standard grade d petrol should only need valve seat inserts fitted to the linder head.

ere could be problems running on a "shandy" of leaded d nleaded unless the unleaded was premium grade.

Reducing compression ratio results in a loss of power and el conomy.

Retarding the ignition is not a means of retuning for

Unleaded petrol has been available in Australia since 1985 and all cars sold since 1986 have been designed to run on it.

Although leaded fuel continues to be available, suggestions have been made that pre-1986 cars which were designed for leaded fuel could be converted to use unleaded, thus facilitating an earlier phasing out of leaded fuel.

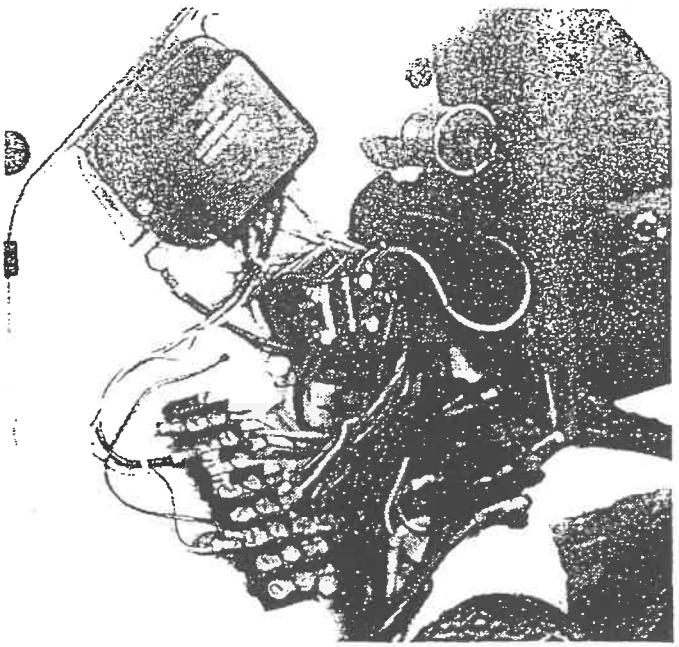
Unfortunately it's not that simple. Some cars be switched over without any modification, some will require extensive modification, and there may be instances where modification will be impossible or too costly.

There are two features of the unleaded fuel which need to be considered in this context;
a. octane number requirement, and
b. valve seat wear.

Octane number requirement

In order to optimise engine efficiency, engine designers strive for the highest compression ratio possible, consistent with the avoidance of detonation in the cylinders. Most pre-1986 engines were optimised for the premium fuel available at that time, i.e. 97 octane leaded petrol. This octane rating permitted compression ratios of around 9.0 - 9.5 depending on the engine type.

Octane number is a measure of the ability of the fuel to resist knock or detonation. The higher the number the better



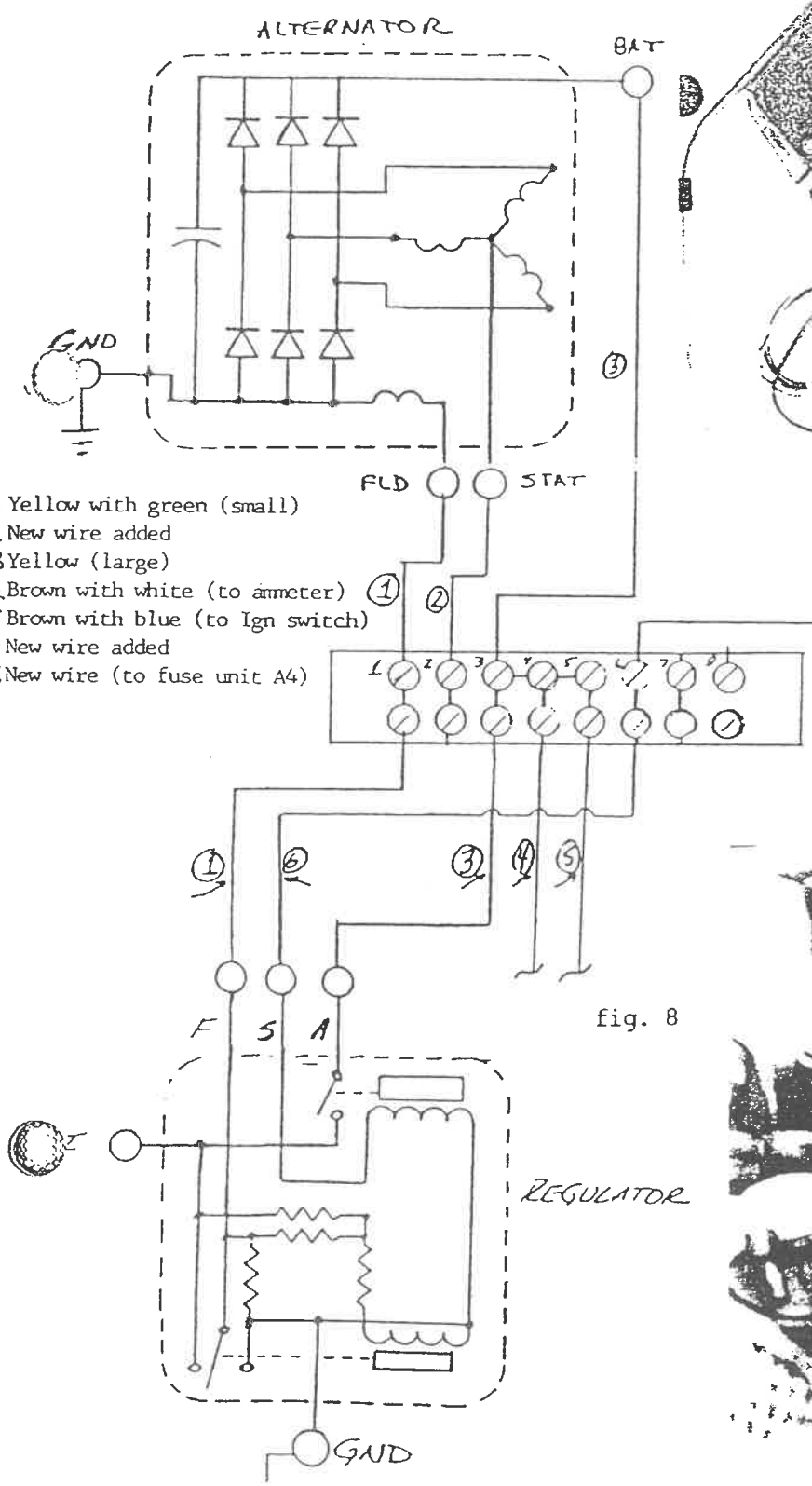
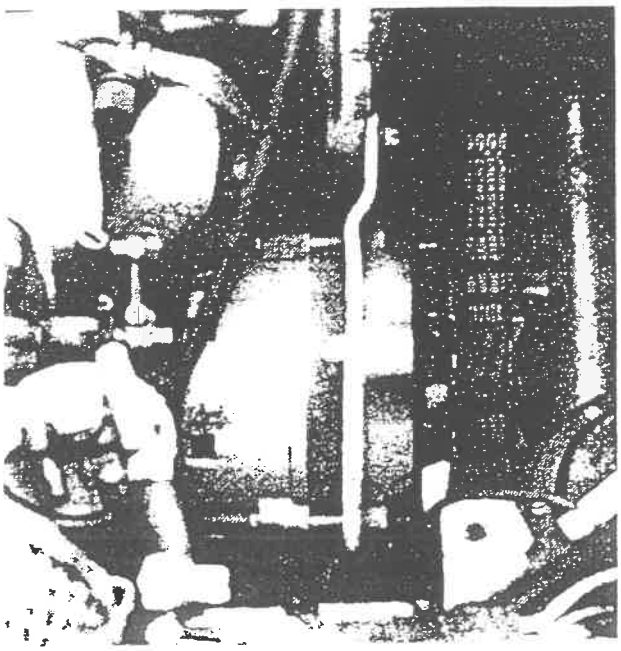

ALTERNATOR
BAT
GND
FLD
STAT
1 Yellow with green (small)
2 New wire added
3 Yellow (large)
4 Brown with white (to ammeter)
5 Brown with blue (to Ign switch)
6 New wire added
8 New wire (to fuse unit A4)
To A4
F
S
A
REGULATOR
GND

fig. 8



Conversion to Negative Ground

om *The Triumph Standard* — SCTOA Sep '89

Is conversion from a Positive Ground to a Negative round worth it? If you're a purist, maybe not. But if ou would like to add some modern electronics such as an AM/FM Cassette player, Radar Detector, or a B Radio you may want to consider converting to a egative Ground. True, a power inverter could be use[illegible] what kind and how much power will be r[illegible] for all your toys? It's easier to convert than to and second guess your requirements for the future.

Is converting difficult? Not as difficult as working ith a Power converter and the change is easily versible. Just use the following simple steps:

1. Disconnect the ground (positive) cable from the Battery.

2. Disconnect the other cable from the battery (negative) that goes to the starter solenoid.

3. Rotate the Battery 180 degrees.

   On the ignition coil, reverse the connections so that the positive (+) or (CB) is connected to the wiring harness and the negative (-) or (SW) is connected to the distributor.

   Behind the dash panel, unscrew the knurled nut holding the retaining bracket for the ammeter. Pull the ammeter out of the dash slowly. Slide the push-on connectors off and reconnect them in the reverse of how the were originally connected. Reinstall the ammeter.

6. [illegible]onnect the battery cable from the starter solenoid to the positive terminal of the battery. Since this is the positive lead you may want to replace the black cable with a red cable.

7. Reconnect the ground cable to the negative terminal of the battery. Since this is the negative lead you may want to replace the red cable with a black cable.

   STOP — IMPORTANT. The next two steps cover polarizing the Generator. It insures that when you start the car, the Generator output is not opposing the polarity of the new reversed battery.

9. Disconnect the SMALLER lead from the wiring harness to the field winding connection of the generator (small spade lug).

10. Obtain a piece of insulated wire that is long enough to reach from the positive battery terminal to the field winding connector of the generator (step 9). Take one end of the other cable and connect it to the Positive end of the Battery (you don't want sparks near the battery that could cause an explosion). Momentarily touch the other end of the cable to the field winding connector of the generator together several times (careful you don't short it to the chassis or engine metal). Unless it's bright out, you should see a small spark each time you do it.

11. Disconnect the jumper wire and reconnect the small wire to the field winding connector on the generator.

12. Start your car and check to make sure the ammeter is reading in the plus (+) side.

Congratulations, you now have a negative ground car and you can now install all the neat little toys you want (except sonic boomers). Some of you may ask, "What about the starter motor and other gauges?"

Electrically, the starter is a series wound motor. Series wound motors always turn in the same direction regardless of polarity of the DC power source. Of the gauges, only the Temperature gauge on TR4s and the fuel gauge in the TR2, 3 & 4 are electrical. They actually rely on an internal heating element to heat a bimetallic strip that then provides the motion that moves the respective gauge's needle. As such, the gauges' internal heating element is also insensitive to polarity. If you think about that for a moment, you will realize that is why those gauges take a few seconds to return to their off position when you kill the ignition switch (the elements need to cool down).

Editor's Note: This article was originally written by Dave Burnell in Dec. 1985 *Triumph Standard*. Bill Sohl, VTR President, provided some additional information in an article that appeared in a later issue of the *English Channel*. Upon trying the conversion, I found some problems which I have edited into this article as well a some notes on battery cable color standards.



PART 6

BODY & FITTINGS

EXHAUST PIPE SUPPORT

AS OUR TR2'S AND TR3'S GET OLDER THEY GENERALLY DEVELOPE AN ANNOYING RATTLE WHERE THE EXHAUST PIPE PASSES THROUGH THE FRAME CRUCIFORM USUALLY THIS COMES ABOUT BECAUSE THE RUBBER ISOLATOR DETERIORATES AND ALLOWS THE PIPE TO HIT THE FRAME.

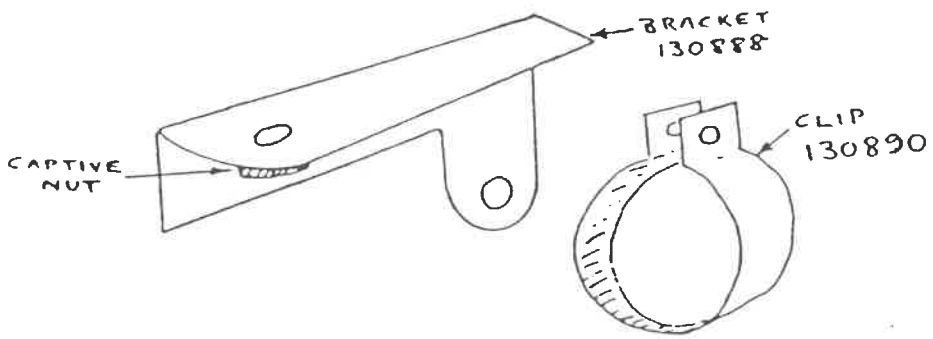
THE PROBLEM WITH JUST REPLACING THE RUBBER ISOLATOR IS THAT WHEN THEY ARE NEW AND TIGHT THEY TEND TO HOLD THE EXHAUST PIPE RELITIVELY STATIONARY IN RELATION TO THE FRAME AND A GREAT DEAL OF STRAIN IS PLACED UPON THE HEAD PIPE AND THE EXHAUST MANIFOLD , WHICH IS MOVING WITH THE ENGINE.

THIS CAN BE OVERCOME WITH THE USE OF TR4 PARTS #130888 (BRACKET ASSEMBLY ; EXHAUST PIPE) , WHICH REPLACES THE RIGHT HAND GEARBOX MOUNT TO A MORE FLEXABLE MOUNT. YOU ALSO NEED PART #130890 (CLIP PIPE TO BRACKET) WHICH JOINS THE PIPE TO THE BRACKET.

WITH THESE PARTS IN PLACE YOU WILL FIND THAT THE EXHAUST PIPE WILL MOVE WITH THE ENGINE AND STOP CLANGING AGAINST THE INSIDE OF THE CRUSIFORM AND YOU CAN INCREASE THE CLEARENCE BY REMOVING THE OLD PARTS.

THESE PARTS OR A REASONABLE FACSIMILE CAN BE FABRICATED QUITE EASILY , AND #130890 CAN BE SUBSTITUTED WITH AN EXHAUST PIPE CLAMP OF THE U-BOLT TYPE.

KEN GILLANDERS - VOLUME 35 , JUNE 1985



BATTERY BOX OR NOT TO BATTERY BOX !

LAST OCTOBER (1990) I BOUGHT A NEW STEEL BATTERY BOX FROM THE ROADSTER FACTORY DURING TRIUMPHEST , I PLANNED TO REMOVE THE OLD AND INSTALL THE NEW AS A WINTER WAS ABOUT TO HIT PORTLAND.

WELL , THINGS AS THAY CAN SOMETHIMES BE , IT GOT PUT TO THE SIDE AND FORGOTTEN. THERE WERE WINTER TRIPS TO MAKE AND WE DID NOT WANT TO MISS A SUNNY DAY. ! TO MAKE A SHORT STORY LONGER , WE DECIDED THAT IT WAS TIME TO PURCHASE ANOTHER TR) WE WENT TO LOOK AT A VERY NICE TR4 , AND EVEN MADE AN OFFER ON THE CAR -- THEN ON THE WAY HOME WE DECIDED THAT IT WAS TIME TO FINNISH THE TR3A BEFORE GETTING INTO ANOTHER PROJECT . THEN THE SEARCH FOR A BODY AND PAINT SHOP BEGAN - IT LASTED FOR ONLY A WEEK BEFORE WE DECIDED ON THE ONE WE WANTED - AND THEY WOULD INSTALL THE NEW BATTERY BOX !

BACK TO THE STORY -- TO CUT COSTS HERE AND THERE , THE BODY SHOP AND I CAME TO AN UNDERSTANDING , I WOULD HELP WITH SOME OF THE BODY REPAIR AND HE WOULD LOWER THE COST.

SOUNDS GOOD TO ME , AND I'M BACK IN THE BATTERY BOX INSTALLATION BUSNIESS !

FIRST I WENT TO THE LOCAL AUTO PARTS STORE AND PURCHASED SOME HIGH HEAT ENGINE PAINT WITH WHICH TO COAT THE NEW BATTERY BOX. SEVERAL DAYS LATER AND MORE THAN ENOUGH PAINT SPRAYED , BACK TO THE BODY SHOP FOR THE REMOVAL OF THE OLD AND INSTALLATION OF THE NEW.

HAMMER AND CHISEL IN HANDS , IENTERED THE BODY SHOP AND STARTED TO REMOVE THE BOX BY LIFTING THE SPOT WELDS THAT HELD IT IN PLACE. SHORTLY I DISCOVERED THAT ALL THE ELECTRICAL EQUIPMENT HAD TO BE REMOVED FROM THE FIREWALL (REGUALTOR , FUSE BOX , STARTER SOLONOID & FLASHER) BEFORE THE HEAVY HAI ERING STARTED. ON THE OTHER SIDE I ALSO REMOVED THE OIL PRESSURE GAUGES HARD LINE IN CASE OF ACCIDENT. THEN THE POUNDING STARTED , AND MOST OF THE BOX CAME AWAY WITHOUT ANY TROUBLE. ALONG THE TOP THE BATTERY BOX IS ATTACHED TO THE UNDERSIDE OF THE BODY TUB , SO INSTEAD OF REMOVING IT I CUT JUST ABOVE THE TOP BEND IN THE OLD BOX , AIR GRINDER WEAS USED TO CUT THIS PART. THEN THE PUPPY FELL INTO THE COCKPIT ! OUT WITH THE OLD !

STRAIGHTENING THE EDGES WAS NEXT , THEN I HAD TO DRILL OUT A PORTION OF THE TOP EDGE OF THE NEW DOX TO ALLOW ROOM FOR THE OIL PRESSURE GAUGE HARD LINE AND THE BOLT THAT HOLDS THE BRAKE LINE TO THE FIREWALL. THE I DRILLED A SERIES OF HOLES ALL ALONG THE EDGES OF THE NEW BOX AND MIG WELDED THE BOX INTO PLACE (WITH SOME HELP) . NEXT I WILL PUT A THIN BEAD OF BLACK COCKING AROUND THE EDGE TO SEAL IT , REATTACH THE DASH SUPPORTS , REINSTALL THE OIL PRESSURE LINE , AND RETURN ALL THE ELECTRICAL EQUIPMENT TO THEIR PROPER PLACES. IN WITH THE NEW !

WHILE THERE I REPLACED THE VENT LIP , WHICH HAD BROKEN AT THE HINDGE , BY CUTTING IT OFF -- THE SCREWS HAD RUSTED. THEN I REDRILLED AND POP RIVITED IT BACK IN PLACE

THE BODY WORK IS ALMOST DONE , IT SHOULD BE DONE AROUND THE FIRST WEEK OF MARCH , THEN HOME FOR THE CROME AND FINISHING OFF BEFORE THE FIRST PTOA TOUR - MARCH 24TH.

JON KORBIN - UNPUBLISHED , FEBRUARY 1991

REAR SPRING MAINTANCE

I HAVE NOTICED A SUDDEN INCREASE LATELY IN REAR SPRING FAILURES , AND WHILE IT SEEMS SOME OF THEM ARE NO DOUBT DUE TO ABUSE , MOST SEEM TO ORIGINATE IN A TOTAL LACK OF MAINTANCE.

MANY OF THE EARLY ENGLISH SERVICE PUBLICATIONS SET FORTH A PROCEDURE FOR LUBING AND SERVICING THE REAR LEAF SPRINGS , BUT THIS GENERALLY SEEMS TO BE OVERLOOKED IN THE NEWER PUBLICATIONS.

BASICLLY , TO SERVICE ANY LEAF SPRING , YOU WOULD REMOVE DIRT AND ROAD GRIME AND THEN YOU WOULD LUBRICATE THE SPRING TO REMOVE OR REDUCE THE RUST AND CORROSION. IT IS THE RUST AND CORROSION THAT INCREASES THE FRICTION BETWEEN THE LEAVES AND CAUSES THE OVERLOADING OF THE MAIN LEAF.

FIRST YOU SHOULD PUT THE CAR UP ON JACK STANDS AND REMOVE BOTH REAR WHEELS. SECOND YOU SHOULD SPREAD NEWSPAPERS UNDER THE REAR SPRINGS -- GET THE IDEA THAT THIS IS A MESSY JOB ! THIRD, USE A STIFF WIRE BRUSH TO BRUSH AWAY ALL THE ACCUMULATED DIRT. FOURTH , THE ENGLISH SERVICE MANUALS RECOMMEND PAINTING THE SIDES AND BOTTOM OF THE SPRINGS WITH A PAINT BRUSH AND GEAR OIL THIS SEEM TO WORK QUITE WELL , BUT IN THE US THE FASHION IS TO MIX ATF (AUTOMATIC TRANSMISSION FLUID) OR LIGHT MOTOR OIL , 2 PARTS TO 1 PART KEROSENE OR PAINT THINNER AND SQUIRT IT ONTO THE SPRING WITH A PUMP TYPE OIL CAN. THIS SYSTEM WILL PROBABLY PENETRATE THE SPRING BETTER , BUT IT WILL ALSO WASH OFF EASIER IN THE RAIN THE REAR SPRINGS SHOULD BE SERVICED EVERY 5000 MILES AND YOU SHOULD ALSO CHECK THE CONDITION OF THE SHACKLE BUSHINGS , FRONT BUSH , AND SHOCK ABSORBER LINK AT THE SAME TIME. EVIDENCE OF OIL LEAVING THE REAR LEVER SHOCK SHOULD ALERT YOU TO AN UPCOMMING PROBLEM.

KEN GILLANDERS - VOLUME 43 , MARCH 1986

REPLACEMENT OF OUTER SILLS (ROCKER PANELS)

TS 41723 L STARTED BUBBLING RUST OUR THE DRIVERS SIDE SILL LAST FALL. THE SILL IS THE PANEL ON THE SIDE OF THE BODY DIRECTLY BENETH THE DOOR. AT THE HIGHLAND GAMES THIS YEAR , I LOOKED AT THE FINE WORKMANSHIP DONE BY JAY SCHOENING ON HIS TR3A SILLS AND DECIDED TO HAVE A GO AT REPLACING MINE. I HAVE NEVER DONE ANYTHING LIKE THIS BEFORE.

THIS IS HOW I DID IT :

I REMOVED THE FRONT BUMPER , FENDER , DOOR , SEAT AND DOGLEG UPHOLSTERY PANEL . THEN I BOUGHT A TOOL FOR REMOVING SPOT WELDS FROM EASTWOOD IT WORKED EXCEPTIONALLY WELL. THERE WERE 58 SPOT WELDS HOLDING THE SILL ONTO THE INNSE SILL . I USED A SMALL AIR DRIVEN GRINDER AND A CHISEL TO CUT OUT THE FILLET WELDS WHERE THE SILL JOINED THE BODY AT THE ENDS . I USED A COLD CHISEL AND SANDING DISC ON AN ELECTRIC GRINDER TO CLEAN UP THE UPPER AND LOWER FLANGES ON THE BODY WHERE THE SILL HAD ATTACHED. I FINISHED UP WITH A WIRE BRUSH AND RUSTY METAL RUSTOLEUM ON THE NOW EXPOSED INNER SILL.

I WAS READY FOR THE NEW SILL , WHICH I BOUGHT FROM MOSS MOTORS FOR $23. I DRILLED QUARTER INCH HOLES EVERY 3 INCHES THROUGH THE NEW SILLS FLANGES . I PLANNED TO ALIGN THE SILL AND POP RIVIT THROUGH THE SILL FLANGES TO THE INNER SILL FLANGES , AND DRIVE THE CAR , SANS FENDER AND DOOR , TO A NEARBY WELD SHOP. I WOULD HAVE THE NEW SILLS WELDED WITH PLUG WELDS (LATER GROUND FLUSH TO LOOK LIKE SPOT WELDS) THROUGH THE PREDRILLED HOLES AND FILLET WELDS AT THE ENDS. FROM THERE THE CAR WOULD HAVE THE SILL AND THE DOOR JAMBS REPAINTED BEFORE I REPLACED THE DOOR , THE FENDER , ETC.....

IT <u>WAS</u> A DANDY PLAN !

IN A FEW SHORT HOURS THE NEW SILL WAS POP RIVITED ON , THE FITTING <u>SEEMED</u> TO BE MINIMAL , ALTHOUGH I WAS DISPOINTED IN THE WAY THE REAR FIT. THE REAR VERTICAL OF THE OLD SILL WAS ANGLED SLIGHTLY AND THE NEW ONE WAS SQUARE. THIS MISFIT LEFT A PIE-SHAPED POINT INSTEAD OF A STRAIGHT JOINT AT THE REAR -- HAD I LEFT IT !

I PUT THE FENDER BACK ON. IT <u>DIDN'T</u> FIT ! THE SILL WAS STICKING OUT FROM THE SIDE OF

THE CAR BY HALF AN INCH AND THE FENDER HAD TO GO ON TOP OF THE FRONT OF THE SILL.

THE NEW SILL JUST WASN'T THE SAME DIMENSIONS AS THE OLD . AFTER A FEW HOURS AT A PANEL BEATERS , WE CONCLUDED THAT THE SILL WAS HOPELESS.

ORDERED ANOTHER NEW SILL FROM LONG'S MOTORS IN K.C. , TRIED TO GET ONE FROM THE ROADSTER FACTORY BUT THEY WERE OUT OF STOCK , AND HAD A SPIRITED CON RSATION WITH THE PEOPLE AT MOSS. I WAS ABLE TO GET MOSS TO CHECK THE CRITICAL DIMENSIONS FOR ME BEFORE I BOUGHT A <u>NEW</u> SILL , WHICH THEY SHIPPED. I HAD A FLY-OFF WITH THE LONG'S MOTORS PART AND THE QC'D MOSS PART. THE LONG'S MOTORS PART WON , BUT BARELY . THEY MAY WELL HAVE COME FROM THE SAME TOOLING BUT THE LONG'S PART WAS A BETTER FIT. AFTER DOING THE OBLIGATORY FITTING AT THE FRONT FIRST , I DECIDED TO "FIX" THE ANGLE PROBLEM AT THE REAR VERTICLE EDGE WHICH TURNES INWARD AND BUTTS AGAINST THE DOGLEG. I STRAIGHTENED OUT THE FLANGE USING A BODY HAMMER AND MY BENCH VICE. I MEASURED THE OLD SILL AND SCRIBED A NEW BEND LINE FOR THE REAR FLANGE . I CLAMPED THE SILL ALONG THE BEND LINE BETWEEN TWO PIECES OF STEEL PLATE AND USED THE BODY HAMMER TO BEND OVER THE FLANGE. WITH A LITTLE FILING AND GRINDING , IT'S A NICE FIT . I WAS ABLE TO LEAVE THE FENDER ON THE CAR (UNBOLTED) FOR THE FINAL FITUP.

HERE IS WHAT I LEARNED FROM THIS FANDANGO :

1) IT IS WORTHWHILE GETTING A FEW TOOLS ; A GOOD SET OF TINSNIPS (RIGHT OR LEFT) THIS COST ME $38 AT LUMBER CITY , EASTWOOD SPOT WELD REMOVER $12 , A BENCH GRINDER WAS A BIG HELP , POP RIVIT EQUIPMENT , DISC SANDER , WIRE BRUSH , AND A COLD CHISEL.

2) A OT OF THINGS CAN BE DONE WRONG WITH THE REPLACEMENT SILL THAT YOU CAN FIX, LIKE THE REAR FLANGE BEING SQUARE. BUT THERE ARE SEVERAL THAT YOU PROBABLY DON'T EVEN WANT TO FIX AND YOU SHOULD RETURN THE PART <u>BEFORE</u> YOU CUT IT UP AND CAN'T RETURN IT. I SUGGEST THAT YOU CAREFULLY MEASURE THE PART WHEN YOU GET IT AND COMPARE IT TO THE ONE YOU REMOVED FROM YOUR CAR. FOR THE AMOUNT OF EFFORT VS. COST , I'D START WITH AN EXTRA SILL ON HAND ANYWAY. TAPER &

REPLACEMENT OF OUTER SILLS continued .....

WARP ARE PROBLEMS YOU CAN'T EASILY FIX.

3) ON MY FIRST SILL , HERE'S WHAT WAS WRONG THAT I COULDN'T FIX , THE WIDTH WAS OFF BY 3/8". WE USED A YODER HAMMER AND A PRESS BRAKE TO UNBEND THE INNER FLANGE . IT WAS THEN DISCOVERED THAT THE SMALL DOOR POCKET INSET WAS SO BADELY TAPERED THAT IT WASN'T WORTH FIXING. THE FIRST PART , ALSO , HAD A BOE OF 3/16 OF AN INCH WHICH HAD TO BE STRAIGHTENED BEFORE WE EVEN STARTED TRYING TO REWORK IT. THE EARLY SILLS MY CAR HAS ARN'T STOCKED ANYMORE , MOSS , THE ROADSTER FACTORY , AND LONG'S SUBSTITUTE THE POST 60,000 PART FOR IT . BUT TO SAY THE PART DIDN'T FIT BECAUSE OF THE HANDBUILT BODY IS A SELF-SERVING EXCUSE , MY FIRST PART WAS JUST POORLY MADE -- I EXPECTED MOST OF THEM ARE.

4) ON THE LONG'S MOTORS PART , I CORRECTED THE ANGLE AT THE REAR AS MENTIONED EARLIER . AT THE FRONT THE PART JOGGED IN TO FIT UNDER THE FENDER. THE SIDES OF THE JOG WERE ROUNDED OUT (BULGED TOWARD THE FENDER , MAKING THE FENDER STAND OUT) AND HAD TO BE FLATTENED WITH A BODY HAMMER. NO PROBLEM ! A LOT OF TRIMMING AT THE FRONT , TAKE IT EASY AND CUT LITTLE PIECES OUT EACH TIME GOOD SHARP SHEARS MAKE THIS PRETTY GOOD THERAPY. BY THE TIME YOU PUT THE ANGLE RIGHT ON THE REAR , YOU'LL FIND THAT THE SILL ISN'T LONG ENOUGH ON THE TOP OF THE HORIZONTAL SURFACE. THERE'S A FLANGE WHICH STICKS UP ON THE HORIZONTAL SURFACE , I BENT THIS DOWN , AND THE PART WAS JUST RIGHT. I WOULD HAVE HAD TO CUT THE FLANGES OFF ANYWAY TO WELD THE END OF THE DOOR JAMBS THERE'LL BE AS SMALL SEAM AT THE REAR BETWEEN WHERE THE FLANGE WAS BENT DOWN AND THE OUTBOARD VERTICLE PART OF THE SILL WHICH GETS WELDED AND GROUND.

5) FIT THE FRONT FIRST !

6) WHEN YOU GET TO THE POINT OF WELDING , I SUGGEST YOU PUT THE FENDER AND DOOR BACK ON FOR THE FINAL SHCEK, YOU HAVE TO BE ABLE TO CLOSE THE DOOR !

MIKE MOORE - VOLUME 82 , FEBRUARY 1990

TUNNEL FEVER

MOST OF US DO AT LEAST A PORTION, OF THE WORK ON OUR OWN CARS SOMETIMES WHAT WE DO IS LIMITED BY OUR ABILITY AND SOMETIMES LAZINESS. SOME JOBS WE LIKE AND SOME JOBS WE HATE. THE JOB THAT SEEMS TO BE HATED THE MOST IS REMOVING THE TRANSMISSION TUNNEL. IT ALWAYS SEEMS TO BE NECESSARY FOR SOME LITTLE JOB SUCH AS ADJUSTING THE OVERDRIVE SOLONOID OR REMOVING THE UPPER BOLTS ON THE REAR TRANS. MOUNTS OR ANY OTHER DOZEN OTHER JOBS THAT ARE A GREAT DEAL LESS WO' ' THAN REMOVING THE TUNNEL.

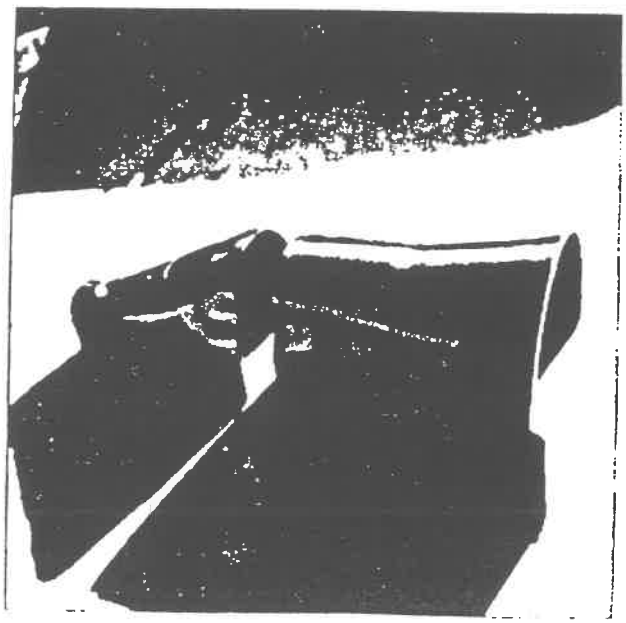
ONE DAY, AROUND THE FIRST OF MAY, I CALLED HOME TO ASK HELEN IF A PACKAGE HAD ARRIVED FOR BRITISH FRAME & ENGINE FROM RACETORATIONS. SHE ASSURED ME THAT IT HAD ARRIVED, BUT SHE TOLD ME IT WAS A VERY LARGE BOX. SINCE I WAS NOT EXPECTING ANYTHING LARGE, I HAD HER READ THE CUSTOMS DECLARATION AND THE PARTS LISTED WOULD HAVE HARDLY FIR IN A SHOE BOX, LET ALONE A VERY LARGE BOX.

WELL, CURIOSITY BROUGHT ME HOME FOR A LOOK. WHAT SHOULD I FIND, IN ADDITION TO THE PARTS I HAD SPECIAL ORDERED, BUT A TWO PIECE TRANSMISSION TUNNEL MADE OUT OF REINFORCED FIBERGLASS. IT WAS NOT BROKEN, BUT ACTUALLY MADE THAT WAY! I CALLED ENGLAND AND ASKED DARRYL UPRICHARD WHAT THE TUNNEL WAS DOING IN MY SHIPMENT, EXPRESSING CONCERN THAT ONE OF HIS CUSTOMERS WAS WITHOUT A PART THAT THEY HAD ORDERED. I WAS REASSURED THAT NO MISTAKE WAS MADE, THAT IN FACT THIS TUNNEL WAS A NEW PRODUCT AND DARRYL WANTED MY EVALUATION.

AFTER A SHORT LOOK, IT BECAME EVIDENT THAT THERE WAS A VERY GOOD REASON FOR IT BEING MADE IN TWO PARTS, THIS NOW MAKES IT UNNECESSARY TO REMOVE THE ENTIRE TUNNEL TO GAIN ACCESS TO THE TRANSMISSION OR OVERDRIVE. YOU NEED ONLY TO PULL FOWARD THE CARPET A SHORT WAY, REMOVE THE SCREWS HOLDING THE BACK HALF AND LIFT IT OUT. VERY SLICK INDEED! THIS UNIT FITS ALL TR SERIES FROM TR2 THRU TR6, AND WH YOU CONSIDER THE RATHER PATHETIC PRESSED PAPER TUNNELS IN THE TR4 AND LATER CARS, THIS UNIT BECOMES A VERY VIABLE POSSIBILITY.

THE TUNNEL IS SHIPPED UN DRILLED, AS THE BOLT PATTERNS DIFFER FROM MODEL TO MODEL ALTHOUGH I HAVE NOT FIGURED OUT WHAT THE PRICE SHOULD BE, IT WILL PROBABLY BE IN THE $80 RANGE. NOT TOO BAD WHEN YOU CONSIDER THE ORDINARY REPLACEMENT FROM THE ROADSTER FACTORY OR MOSS IS $50.

KEN GILLANDERS - VOLUME 86, JUNE 1990



TAKE A BOW

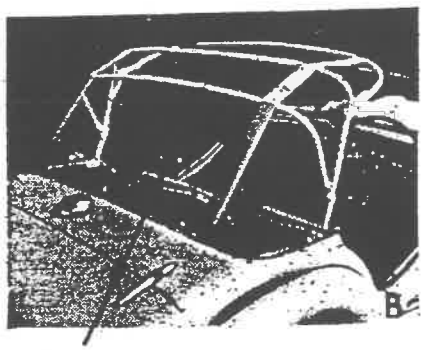
WHEN I BOUGHT MY TR3A FROM MY BROTHER IT HAD BEEN STORED OVER TEN YEARS BEFORE BEING READIED FOR MY CROSS COUNTRY DRIVE TO L.A. MY TR HAD A NUMBER OF PARTS ON IT FROM A TR2, ONE OF WHICH WAS AN ORGINIAL SINGLE WINDOW CONVERTIBLE TOP. THIS TOP WAS A NIGHTMARE TO ERECT, AND REQUIRED THREE PEOPLE AND A GERMAN SHEPARD TO STRETCH IT INTO PLACE. IT WAS SO BAD THAT I STRATEGICALLY ATTENDED EVERY FALL TECH CLINIC TO ENLIST HELPERS TO BATTLE THE RAISING OF THE TOP FOR THE WINTER!

DURING ONE OF THESE SESSIONS, BOB ROLFES OVERHEARD MY TIRADE AT THIS SORRY STATE OF AFFAIRS, AND REMARKED, "WELL, WE MINNESOTANS HAVE LEARNED A TRICK FOR DOING IT EVEN IN THE DEAD OF WINTER. IF YOU LEAVE THE REARMOST BOW UNATTACHED FROM THE WEBBING, YOU CAN COLLAPSE THAT BOW, MAKING IT MUCH EASIER TO SNAP ALL THE FASTENERS INTO POSITION. FROM INSIDE THE CAR, YOU CAN REACH BEHIND AND EASILY PUSH THE BOW REARWARD INTO PLACE." AFTER EXICTEDLY TRYING THIS METHOD AND FINDING THAT IT WORKED BEAUTIFULLY, I WAS ABLE TO RAISE AND LOWER THE TOP MYSELF AT WILL! AT LAST, A FUNCTIONAL COVERTIBLE!

SUBSEQUENTLY, WHENEVER I'VE SEEN SOMEONE STRUGGLING WITH THIS SAME PROBLEM, I RELATE THIS SOLUTION, WHICH I'VE FONDLY DUBBED "THE MINNESOTAN METHOD" AND, ALTHOUGHT I HAVE SINCE SWITCHED TO A PROPER TR3A TOP, I STILL USE THIS TRICK TO MAKE MY LIFE EASIER. THANKS AGAIN, MR. ROLFES!

SUE DAVIS, VOLUME 89, OCTOBER 1990

ILLUSTRATION REPRINTED FROM "PRACTICAL HINTS FOR MAINTENANCE OF THE TRIUMPH T.R. 3"



UNDO THE WEBBING FROM THE REAR BOW BY REMOVING THE FASTENER PLATES AND RE-ATTACHING THEM DIRECTLY TO THE BOW, UNDERNEATH THE WEBBING.

HEAT INSULATION

TRSC HAS SOME GREAT EVENTS COMING UP THIS YEAR , AND NOW IS NOT TOO EARLY TO GET READY FOR THEM . IN THINKING BACK ON THE FIRST SEQUOIA TRIP A FEW YEARS AGO , I REMEMBER HOW HOT IT WAS . WITH A LITTLE ATTENTION TO HEAT INSULATION YOUR TRIUMPH CAN BE MUCH MORE PLEASANT .

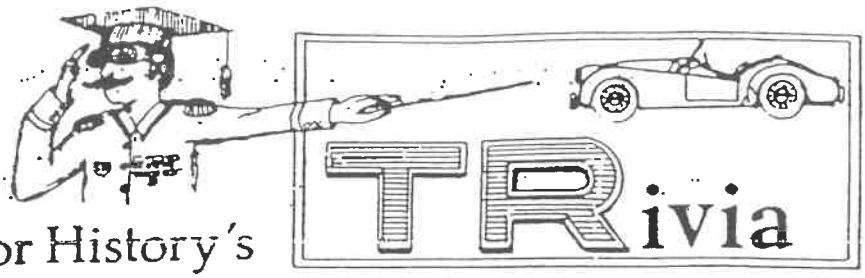
THE FIRST AND MOST OBVIOUS THING TO DO IS TO FILL ALL THE HOLES IN THE FIREWALL AND FLOOR . THE FIREWALL HOLES CAN BE SEALED WITH GROMMETS AND PLUGS AVAILABLE FROM THE ROADSTER FACTORY , AND THEY ARE CHEAP . THE BIGGEST OFFENDER IS USUALLY THE TUNNEL . MANY OF THE STEEL TUNNELS ON TR 2 AND TR3 'S HAVE GOTTEN RUSTY OR ILL FITTING . THE CARDBOARD TUNNELS OF THE LATER CARS USUALLY HAVE CHUNKS MISSING OR READY TO GO . A NEW TUNNEL IS A GOOD INVESTMENT . THE ROADSTER FACTORY MAKES THEM OUT OF PVC PLASTIC , NOT FIBERGLASS , THAT IS AMAZINGLY DURABLE . THIS IS A MUST BUY IF YOU NEED A TUNNEL , BUT DO NOT BUY THE SEAL KIT THAT GOES WITH IT (SEE BELOW) . YOU WILL HAVE TO DRILL YOUR OWN HOLES , WHICH IS GOOD , ESPECIALLY IF YOUR FLOOR HAS BEEN REPLACED (IT'S NOT THAT HARD) . (COMPILER'S NOTE : - BRITISH FRAME AND ENGINE SELLS A TWO PIECE TUNNEL , GOOD IDEA FOR THOSE WITH OVERDRIVE). THE VERY BEST WAY TO SEAL THE TUNNEL IS WITH TRIMBRITE'S METAL MEND TAPE . THIS IS NOTHING MORE THAN SELF ADHESIVE ALUMINUM TAPE . IT IS 3" WIDE AND FIVE FEET LONG . IT CAN BE MOLDED AROUND CORNERS AND EDGES , THEREBY FILLING GAPS BETWEEN THE FLOOR AND THEE TUNNEL (THE WORST BEING OVER THE HUMP OVER THE PROP SHAFT , JUST BEHIND THE GEARSHIFT) . ONCE THE TUNNEL IS SECURE , COVER THE SEAMS WITH ALUMINUM TAPE . TWO ROLES WILL MORE THAN COVER IT , AND CAN BE USED FOR JACKING HOLES OR WHATEVER ELSE . YOU'LL FIND IT IN MOST AUTO PARTS STORES IN THE BODY SECTION AS WELL AS IN SOME HARDWARE STORES . IT WILL TAKE UP TO 250 DEGREES , AND WORKS GREAT ON MY CARS - PART # T-1822 . ONCE ALL THE HOLES ARE FILLED , THEN YOU CAN INSULATE . MOST MODELS OF TRIUMPH SHOULD NOT HAVE THEIR CARPETS GLUED TO THE FLOOR . IF YOURS IS , THEN YOU'RE STUCK (WATCH FOR RUST) . IF NOT , THERE ARE SEVERAL WAYS TO INSULATE THE FLOORS (ENGINE AND EXHAUST HEAT CAN GET THE FLOORS TOO HOT TO TOUCH ON A HOT DAY) . SIMPLE JUTE PADDING CAN BE BOUGHT IN MOST UPHOLSTERY SHOPS , AND IS INEXPENSIVE AND DUPLICATES THE FACTORY INSULATION . A MORE HIGH TECH SOLUTION IS "KOOL-KAR'S" INSULATION KIT . A 4 ' X 10' ROLL WITH ADHESIVE COSTS $44.95 AND WILL KEEP OUT 97 PERCENT OF THE HEAT.

CUT THIS INTO THE FIREWALL AND FLOORS , AND NO MORE HOT FOOT !

SIMCE MOST OF THE HEAT IS GENERATED BY THE EXHAUST PIPES , YOU MIGHT TRY "THERMO-TEC" INSULATION . THIS IS A 2 " TAPE THAT WRAPS AROUND THE EXHAUST PIPES , SECURED BY SIMPLE HOSE CLAMPS (BAND TYPE) . THIS CAN REDUCE UNDERHOOD TEMPS AS MUCH AS 70 PERCENT AND SHOULD BE CONSIDERED A MUST WITH HEADERS . ONE 00' ROLL COULD EASLY DO 2 CARS (WITH STOCK EXHAUST , WRAPPED FROM THE MANIFOLD BACK TO JUST UNDER THE FLOOR . AT $80 A ROLL , YOU MIGHT WANT TO SPLIT IT WITH ANOTHER MEMBER .

TRY THESE THINGS OUT , AND DON'T LOOSE YOUR COOL THIS SUMMER ! !

STEVE HEDKE - VOLUME 94



Major History's

TODAY'S TOPIC - FRONT MEDALLIONS

The front apron medallion which boldly proclaimed the identity of our TR-2 or TR-3 to passers-by was changed four times during the production life of the cars. Shown here are the four versions of the medallion and a note about which cars wore them.

A) - Used on all TR-2s. (Commission no. TS 1 to TS 8636) They were red and black with 'TR-2' at the top and the name TRIUMPH spelled out at the bottom.

B) - Used on all TR-3s. (TS 8637 to TS 22013) (small-mouth) Upper plate changed to read 'TR-3';otherwise same as TR-2 medallion.

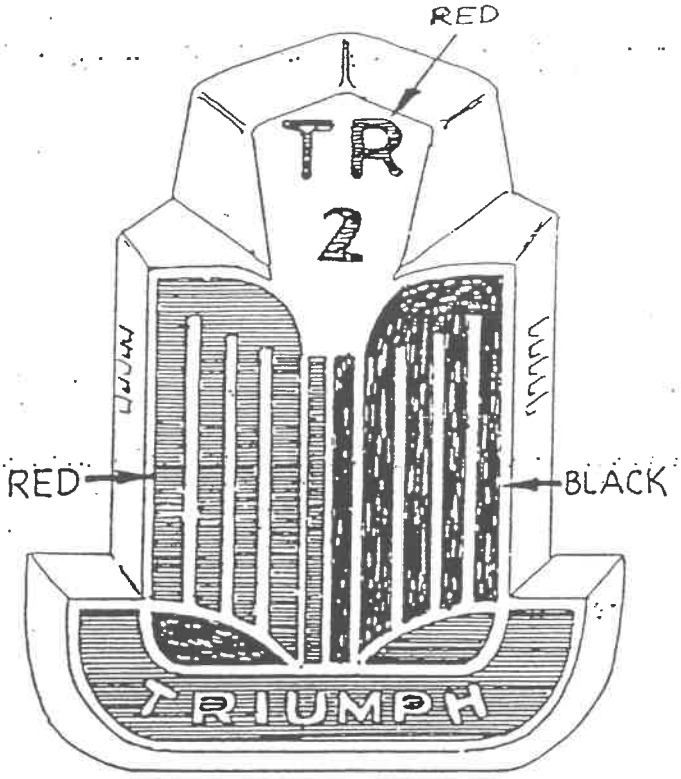
C) - Introduced on the wide-mouth TR-3A (TS 22014) and used up to TS 41877. Identical to previous TR-3 medallion except for TRIUMPH name deleted at the bottom. This was removed since the TR-3A had the individual chrome letters spelling out the name above the new wide grille.

D) - During 1959, starting with TS 41878, the TR-3A medallion had its colors changed to blue and white. This was done to honor the formation of Standard-Triumph International, the distribution organization set up to handle export sales, primarily here in the U.S. (the S.T.I. house colors were blue and white) The medallion continued in this form for the remainder of the TR-3A and TR-3B series.

If you are looking for a medallion, both TR-3A types have been available in reproduction form for several years and can be purchased from most of the TR parts places. The TR-2 and 3 versions have been pretty much extinct, although I did see a new repro TR-3 badge that someone had ordered through the mail from a place in New Jersey. However, none of the major suppliers list it as being available. Triumph Specialty of San Jose show a photo of the TR-2 medallion in their catalog alongside the blue and white TR-3A job and they imply that all are available, although I have not checked it out myself.

Martin Lodawer
Newsletter #7

Illustration on next page



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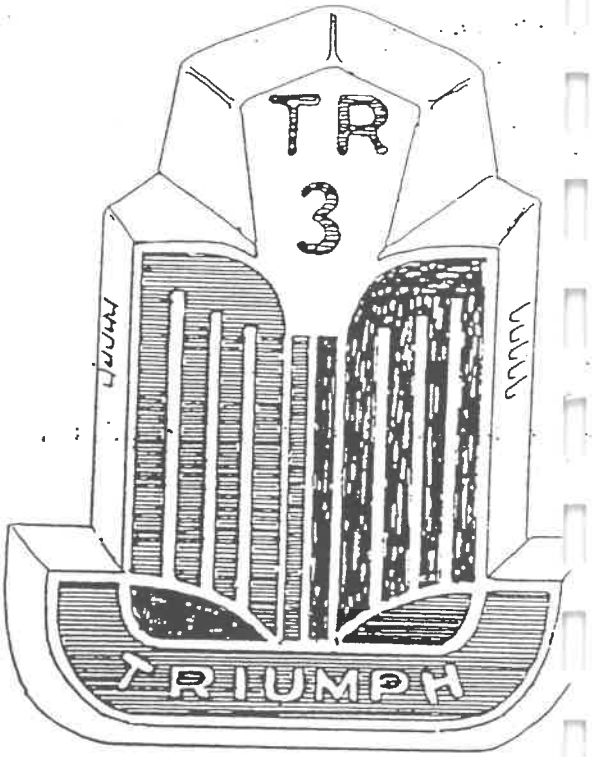

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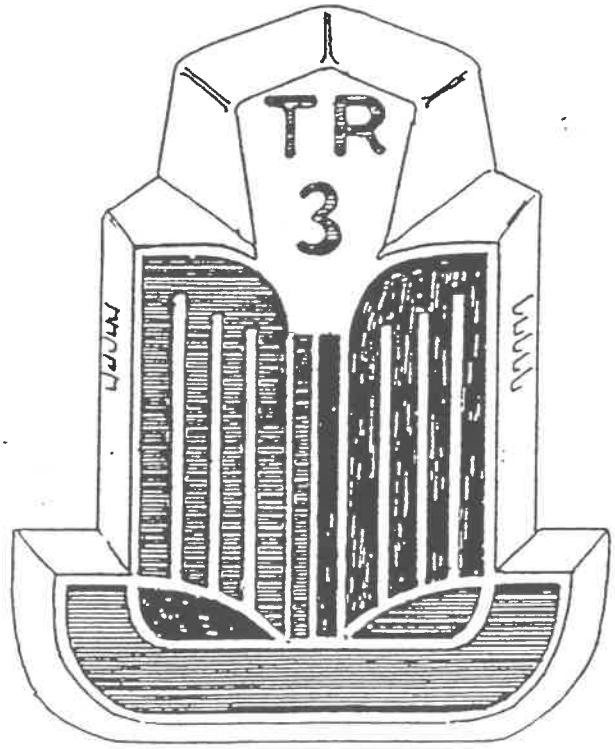

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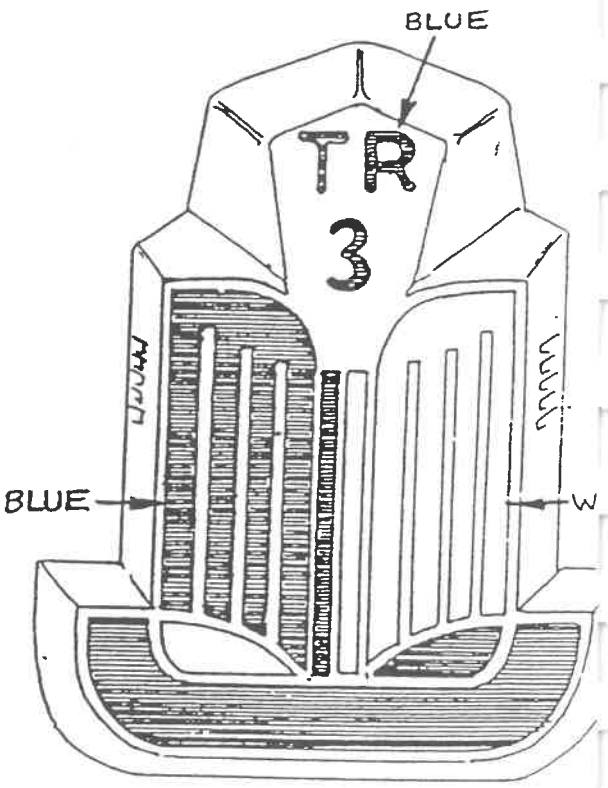

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SPEEDOS & TACHS

It seems that the older we get, the more our thinking gets locked into one track. Recently I had an experience which tended to throw the switch on my one-track mind.

A group of my friends had gathered in my garage for an informal session of bench racing, beer drinking, etc., when the subject got around to the relative accuracy of mechanical tachometers and speedometers compared to electronic ones. I offered that the mechanical system on the Triumph was accurate, and remained so throughout its lifetime. That proclamation brought about a great deal of argument that mechanical tachs and speedos should be calibrated from time to time, as wear, fatigue, and extended use tend to throw them off, usually so that they read high.

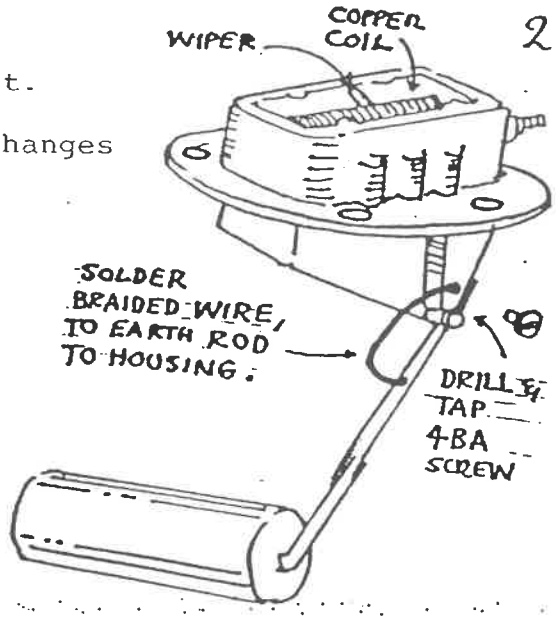
After much discussion, it was agreed that an electronic Sun tachometer would be used to compare the relative accuracy of the tach in the TR-2. To get a common base line, the Sun was checked against the tach in the Corvette and against a recently rebuilt one in an Austin-Healey 3000. When we finished, lo and behold, the tach in the TR was 300 RPM high at idle and 500 RPM high at 3000 RPM.

After having the tach calibrated, I noticed a rather remarkable difference between the tach and speedometer when I was under way, particularly in fourth gear, where the tach reading is supposed to be directly related to the speedo reading (half of it-ed.). Out came the speedometer, and it was found to be reading 8 mph high at an indicated 70 mph. The people at the speedometer shop (MO-MA in North Hollywood) stated that my problems were almost the usual of long use and no recalibration, and that any car over twenty years old can expect it. (A number of our club members have had MO-MA rebuild instruments, and if what I have seen is representative of their quality, they must be very good indeed.)

Unfortunately, a high-reading tach creates a fallout problem in that the owner seemingly can't get the engine to idle smoothly below an indicated 1000 RPM, while it is actually idling between 600/700 RPM, far too slow for proper cylinder wall lubrication. It might pay to check these instruments out.

The above,& several other articles published this issue are from our TR friends in the TR Register of Southern California.Our thanks yet again to them for permission.Other reprinted items include one from Bob Schaller of Phoenix,Arizona.Again,our thanks.

This originally appeared in 'Flat Chat'
the magazine of the O.H.O.C. in Australia.
Our thanks to them for permission to reprint.
It is beleived that this cure will work for
TR owners as well with,of course,whatever changes
are required re wire colors,fuses etc. mm.



HAVE YOU GOT THE FUEL-GAUGE-NEEDLE JITTERS?

Electronic whiz-kid, Neil Dunn, has the answer.

The jittery needle with the jim-jams that flicks from side to side will eventually wear out the needle as it bangs against the stops on each side. This at least indicates that the gauge is working.

The fuel gauge is a "current meter" and is connected on the"hot" side B (battery) with a green wire to A4 on the 35 amp fuse block. A second green wire attached to the B terminal provides power to the heater switch or tacho on later models. The other terminal on the gauge T (tank) is the earth and connected to the sender unit on top of the fuel tank.

This earth wire is connected to one end of a finely wound copper resistance coil that's inside the top of the sender unit. Sliding on each side of this coil is a pair of wipers and these are attached to the float by a pivot pin at the base of the sender housing. As the tank empties, the float drops down and the wipers move further along the coil increasing the resistance and lowering the current to the gauge on the dash.

The integrity of the earth relies upon contact between the float pin pivot and the housing. As this pivot wears, a poor contact occurs and as the float is bouncing around on top of the fuel, this bad earth is turning the gauge on and off and the fuel gauge needle is frantically waving good-bye to you.

Another cause of poor contact is the contact between the resistance coil and the wipers.

Earthing of the sender unit housing relies upon contact with the fuel tank which is earthed via the copper delivery pipe that goes to the fuel pump. On many cars this pipe is cut to take an in-line fuel filter and earth contact is lost. The tank itself is not a reliable earth as it is mounted in place with rubber lined metal straps.

Neil's answer is to provide a good earth contact between the float and sender housing by soldering a flexible braided wire from the float arm and attaching the other end to the housing. You can drill and tap a blind 4BA thread into the thickest part of the housing near the pivot point and fit a small crew and put araldite over the head of it to keep it secure. Check that the tank is a good earth and if not run an earth wire from one of the housing securing screws to the chassis.

Flatten the ends of some cotton buds, dip into some lighter fluid and carefully clean the sides of the resistance coil and the wipers. Don't press too hard on the wipers as you may bend them. Connect an OHMS meter to the terminal and the housing, Raising and lowering the float should show a resistance range from ~~4 OHMS full to 150 OHMS~~ empty. The fuel gauge needle will be quite steady now and if appears inaccurate take the sender unit and gauge to Olympic Instruments and they'll calibrate for you.

@ EMPTY 75 OHMS @ FULL

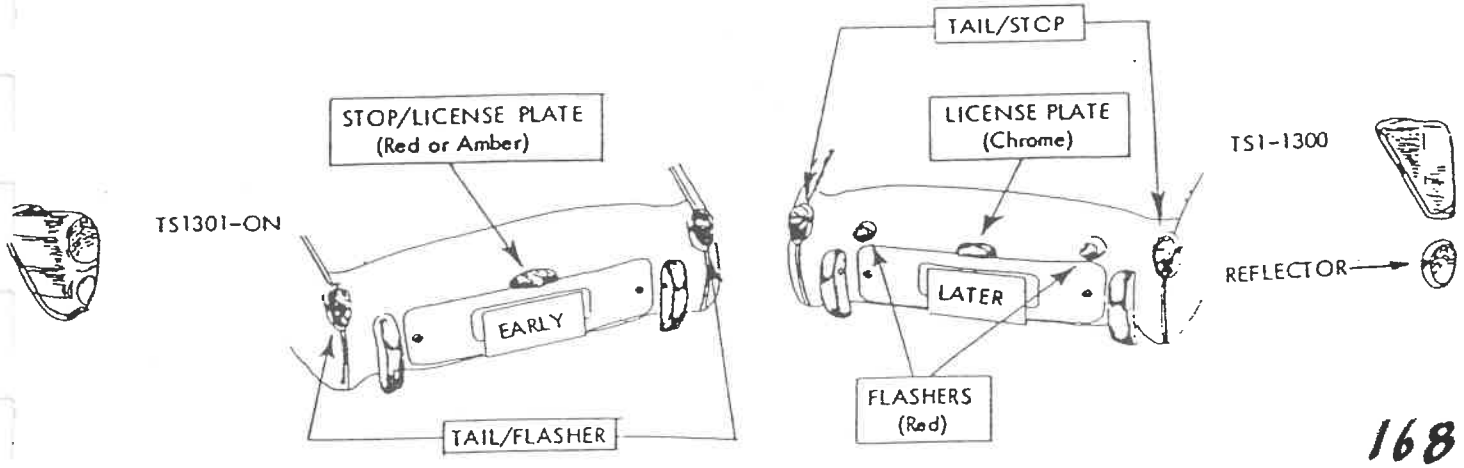
MISC. ANNOYANCES

As our TR's become more elderly and more used, they can start developing some strange and disturbing noises and non-desireable behavior. Here, we'll try to describe a few symptoms that we have seen over the years, and the answers that we found to them. The list is by no means complete and the answers may not always solve your particular problem, but it is a place to start.

A high-pitched squeak that appears to come from the right rear corner of the car and seems worst on uneven pavement or when going around corners can usually be traced to the fuel tank overflow pipe rubbing against the lower spring plate or even the frame itself. The cure is simply to bend it slightly out of the way and to be careful of it in the future when you raise up the car with a floor jack.

A squeak in the front end when going through dips in the pavement that cause a good amount of suspension travel can generally be traced to the front shock absorbers. The seal in the damper used on the early cars would dry out and then squeak. The only solution I have found is to replace the shock absorber. (Editor's note: another common cause of front end squeaking, especially at low speeds on rough surfaces, are the nylon lower A-arm bushings fitted to these cars (except the TR-2 and very first TR-3's). These must be oiled regularly or they'll squeak like hell.)

A rumble or squeal that begins when you step on the clutch pedal and goes away when you take your foot off is generally a bad clutch release (throwout) bearing. The origin of this problem is usually NOT in the bearing itself, but in the use of wrong linkage and/or return springs in the clutch unit, which results in premature failure of the bearing. There is one, REPEAT, ONE correct return spring and linkage to be used in the TR-2/3/3A/3B series vehicle, and anything else (door springs, pieces from hardware stores, later linkage parts, etc.) will bring your release bearing to grief. The correct parts are available from the Roadster Factory, and probably the other major parts places such as Moss Motors, Start Your Engines, and Sports & Classics.



The item reprinted below is a publication of a windscreen supplier in the Sydney area; RALPH MOORE Autoglass p/L., located at 6 John St., Mascot.N.S.W. 2020.Ph.(02) 6671628/1933.The inclusion is for your general interest only & is not intended as an endorsement or otherwise.They do,however,appear to carry an extensive range of TR screen fittings,some of which they have had re-manufactured.As a general observation,rebuilding of TR screens tends to be an expensive undertaking & ,it is suggested,you should get a detailed quote from ANY supplier that you patronise.

mm.

METHOD: FITTING WINDSCREEN TO TRIUMPH

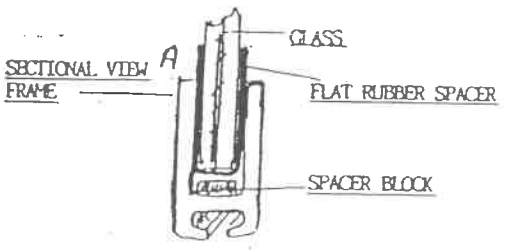
TR 2, 3, 3A.

1.	Windscreen frame	(Diassembled) Frame parts
2.	Glass	Sides and top frame - 1 piece
3.	Rubber strap cut into 10 pieces ½" wide across strap	Bottom frame - L.H. post - R.H. post 2 x chrome spacer - flat
4.	1 x Tube urethane	2 x corner brackets
5.	1 x Roll 1½" or 2" masking tape	4 x side brackets for post to screw into
6.	2 x Blocks of soft material	6 x screws
7.	Rubber spacer blocks x 8.	8 x Screws 4 x Screws

plated spacer washers may be used behind male trim pins

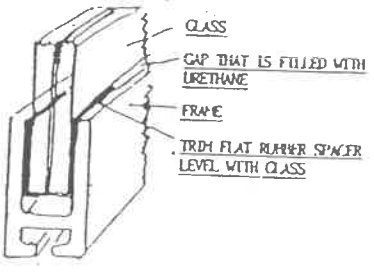
Method: Assuming that frame has been removed from the car and disassembled, assemble frame without the glass, making sure screws are threaded correctly, go in easily and do not protrude past the brackets, because, if they hit the edge of the glass, this can crack the glass. Make sure corners of the frame come together correctly, check that the male trim fasteners across the top outside of the frame go in easily and do not protrude to the extent that they may damage the glass. Then remove all of them fit them back after glass is fitted, using a drop of contact glue on the thread,- if any screws will not go in easily, check alignment of holes; if threads are damaged, re-tap threads in brackets or frames, discard damaged screws and replace with new ones. Fit 8 rubber spacer blocks as in diagram. Having checked and prepared frame, fit the glass to the frame to make certain that the frame has not been distorted by handling or re-chroming - this often happens when re-chroming has been done. Care should be taken to reshape the frame to the glass, testing often to ensure correct shape and the glass fits easily in the centre of the groove without causing pressure on the glass. The glass should be loose in the frame.

Remove glass from frame, take flat rubber pieces (10) and use to centralise glass frame as in sectional view. A



SECTIONAL VIEW B.

SCREW FRAME TOGETHER USING RAZOR BLADE OR STANLEY KNIFE TRIM OFF FLAT RUBBER SPACER LEVEL WITH FRAME.



OVER PAGE

WIRE WHEEL CONVERSION

Being somewhat of a latent wire wheel freak, I know when I purchased our 1960 TR3A two years ago that I would not find true happiness in this world until I could afford to convert the car's disc wheels to wires. Research of various and sundry articles on TR2/3/3A/3B's and the Stanpart Spare Parts Manual for TR 2, 3 & 3A models indicated that the factory offered wire wheels as an extra cost option on these cars in seven combinations. The standard option was a 48 spoke wheel (size 4Jx15) available in bright chrome, lacquer (presumably the same color as the car) or aluminum. A 60 spoke wheel (size 4½Jx15) was offered as a high speed equipment option and was available in bright chrome, dull chrome, lacquer or aluminum. The 48 spoke wheel was more common and to some, more esthetic. However, the 60 spoke wheel with 12 more spokes is considerably stronger (and one half inch wider).

Wire wheels from MGA's and TR4's can be fitted without modification to TR2 and TR3's. While I would have preferred bright chrome wheels, their cost new ($150 each) and lack of availability used forced me to go for painted wheels. A TR4A owner with no love for wire wheels and their inherent problems and service costs "unloaded" his five 60 spoke wheels, splined adapters and knock offs on me for a paltry $25.00.

Parts required for wire wheel conversion

5 wire wheels
2 RH splined adapters, coarse thread - 4 bolt pattern
2 LH splined adapters, coarse thread - 4 bolt pattern
2 RH knockoffs
2 LH knockoffs
16 wire wheel adapter lug nuts (disc wheel nuts will rub)
5 inner tubes

When purchasing wire wheels and adapters inspect them carefully to be sure that all splined edges are sharp. If wire wheels are not properly tightened, they can spin on the adapters and ruin the splines.

I took my used wire wheels to Ed Werndorf, owner of Valley Wire Wheels in Van Nuys, California. Rebuilding wire wheels is fast becoming a lost art and I found Werndorf to be a conscientious craftsman with an appreciat for auto restoration. He dipped the old and dirty wheels in an acid tank to remove the old paint and rust and then replaced bent spokes and nipples as needed. Next he trued the rims and trued the spokes. Werndorf sprays th rebuilt wheels with Dupont 713A "Bright Aluminum" acrylic enamel paint which from his experience best approximates the factory's original aluminum color.

Disc wheel studs are too long for use with wire wheels. Rather than replace them with the shorter wire wheel studs, I had the excess length ground off and then mounted the adapters with the smaller wire wheel nuts. Wire wheels require the use of tubes in the tires. The tires were mounted and the wheels placed on the adapters after application of a temperature resistant grease on the splines to prevent the wheels from freezing on the adapters, and the wheels then spin balanced.

After thanking Werndorf for his work (and paying the bill) I roared away with a grin on my face and my neck hanging out over the door to catch the sun's sparkle off the turning chrome knockoffs. The pleasure was nearly obscene! and all this for only $325.

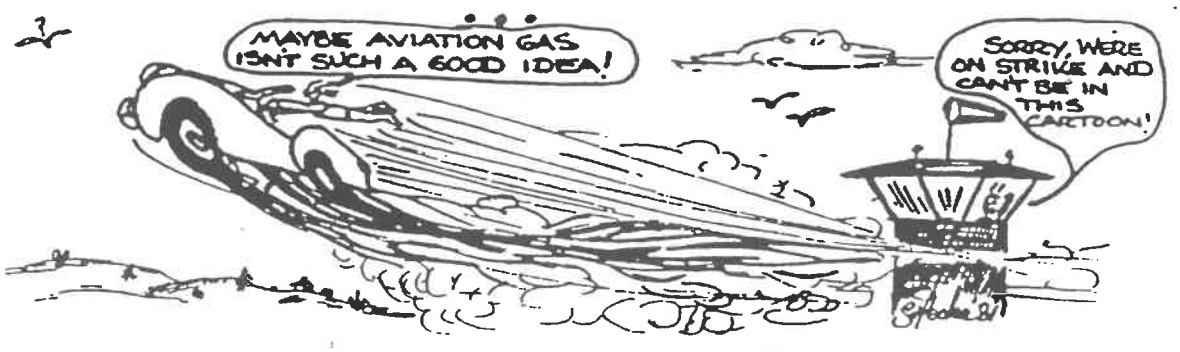
Tim Matthews
Newsletter #2

Recently I purchased wire wheels for my '57 TR3. Along with the wire wheels came 20 years of dirt and rust. I'm exaggerating, of course, but the wheels were dirty and rusty. After wire brushing, sanding and naval jelly, they were ready to paint. An easy matter, yes; no! The problem for me was trying to match within reason the silver-grey color of the wheels originally. I tried paint stores, hardware stores, auto parts stores, all with no success. I called BMC in Anaheim to see where the dealer got their paint or if they had any, but no luck. It seemed that all that is offered is grey (which is too blah), silver which is too silver, and aluminum which is too something. So I tried aluminum; ICK; it looked terrible. I knew the paint must be available somewhere because new cars have close to this silver grey color on their rims. While visiting H&J Imports, they suggested I inquire at Commonwealth Classic Cars which specializes in the restoration of MGs. Upon arrival, I was told they had their paint specially mixed, (my heart sunk) however; there was a glimmer of hope. A post script was added. Before they had a spray gun, they used a canned silver spray paint and then sprayed clear over it, which toned it down and gave it that silver-grey color. SO what-the-heck --- I tried the clear over the aluminum and EUREKA! the color I found soothed my eyes.

Maybe everyone else knows where to find this color, but for those of you who didn't (like me) I thought I would share my experience. ENJOY!!

Steve Melton

Newsletter #1



Knock-off Hubs and Splines

by Ken Gillanders

There always semms to have been many misconceptions about taking off and putting on wire wheels, as well as the care of the wheel centers and hubs. I am sure that, at one time or another, we have all watched some poor soul with a flat tire trying to remove a wire wheel whose center was rusted together with the hub. At the other end of the scale, we have all seen wire wheels caked with grease which has leaked out of the hub and then mixed with road dirt.

I wrote an article some years ago recommending the sparing use of Vaseline petroleum jelly for wire wheels, but now there are better things available. The lubricant on the splines of a wire wheel is really intended as an anti-rust agent, as there is precious little moving in there to lubricate. However, I have now taken to using disc brake-type (molybdenum disulfide) wheel bearing grease, very sparingly, as it is very resistant to heat, and thick enough that the centrifugal action of the rotating wheel has a harder time trying to pull it out along the spokes. I am sure that there are better products for this purpose on the market, and I am always open to suggestions.

Next comes the tightening process. I have no idea why it is necessary to pound on the center lock hub ears until it is 1/4 turn past stripped. Sure, they need to be tight, but trying to pull the unit inside out just doesn't make it.

I'm not sure what the average TR owner thinks the knock-off is made of, but for those who don't know, they are made of brass, and that is why they get so beat up from hammers. A good way to keep them looking nice is to put a block of wood, such as maple, or some other hardwood, between the hammer and the chrome-plated brass ears.

It also doesn't hurt to go around your wheel with a wrench while it is lying on the floor and rap on the spokes. You will be able to distinguish bad ones by the sound they make, a clunk' instead of a bell-like note.

THE FOREGOING TWO ARTICLES BY KEN GILLANDERS APPEARED IN THE TRIUMPH TUNE. THE MAGAZINE OF THE TRIUMPH REGISTER OF SOUTHERN CALIFORNIA. THE ARTICLES ON BOW STRAIGHTING REPLACEMENT.SOFT-TOP ERECTION AND NEGATIVE GROUNDING ARE RE-PRINTED FROM "RAG TOP" THE MAGAZINE OF THE TORONTO TRIUMPH CLUB IN CANADA WHO ARE CELEBRATING THEIR 10TH ANNIVERSARY THIS YEAR. OUR SINCERE THANKS TO BOTH CLUBS.

mm

ROUTINE MAINTANCE

EACH TIME WE PERFORM THE COMMONLY DONE ROUTINE MAINTANCE , SUCH AS CHANGING THE OIL AND LUBING THE CHASSIS (ABOUT EVERY 2000 TO 3000 MILES) , THERE ARE A VARIETY OF FITTINGS AND LUBE POINTS THAT APPEAR TO GET OVERLOOKED UNFORTUNATELY THESE ULTIMATELY RESULT IN WEAR IN PLACES THAT ARE DIFFICULT TO GET TO AND ON PARTS THAT ARE DIFFICULT TO REPLACE . THEREFORE , PERHAPS A CHECK LIST WOULD BE IN ORDER OS THAT YOU COULD KEEP TRACK OF YOUR TR SERVICE

IN ADDITION TO THE LUBE FITTINGS ON THE FRONT SUSPENSION AND ON THE CROSS SHAFT OF THE TRANSMISSION , THERE ARE , IN FACT , THREE ON THE HAND BRAKE AT THE REAR OF THE VEHICLE. TWO ARE ON THE PIVOTS THEMSELVES AND ONE IS ON THE CABLE IF THESE GET OVERLOOKED FOR TOO LONG THE HAND BRAKE WILL BECOME VERY DIFFICULT TO OPERATE AND WILL EVENTUALLY END UP WITH THE PIVOTS FREEZING SOLID AND THE CABLE RUSTING INTO THE SHEATH. WHILE THE CAR IS UP IN THE AIR , IT IS ALWAYS A GOOD IDEA TO TAKE AN OIL CAN WITH SOME MODERATE WEIGHT OIL AND PUT A DROP OR TWO ON EACH OF THE CLEVIS PIN CONNECTIONS IN THE HAND BRAKE SYSTEM STARTING ALL THE WAY FORWARD AT THE BOTTOM OF THE HAND BRAKE LEVER AND CONTINUE BACK TO THE CLEVIS PINS AND JOINTS THAT ARE ATTACHED TO THE BACKING PLATE AT THE REAR WHEELS.

WHILE YOU ARE IN THAT AREA TAKE THE OPERTUNITY TO LUBE TWO OF THE MOST COMMONLY OVERLOOKED LUBE FITTINGS ON THE ENTIRE CAR , THOSE ARE THE TWO THAT ALLOW FOR THE LUBRICATION OF THE REAR AXEL BEARINGS , A COUPLE OF STROKES WILL SUFFICE , IT IS ASKING FOR TROUBLE TO OVERFILL THAT CAVITY

AS WE POINTED OUT IN LAST MONTH'S TRIBUNE , IT IS A GOOD IDEA TO TOP OFF THE STEERING GEAR BOX AT LEAST EVERY SERVICE , OR TO AT LEAST , MAKE SURE THERE IS LUBRICANT IN THE BOX .

THERE ARE A NUMBER OF PLACES WITHIN THE CAR WHICH WE ROUTINELY IGNORE , WHICH IN FACT CAN COME BACK AND BITE US AT A LATER DATE . ONE OF THE MOST COMMON IS THAT A DROP OF OIL SHOULD BE PLACED UNDER THE ROTOR AND ALLOWED TO FLOW AROUND THE SCREW THAT HOLDS THE DISTRIBUTOR CAM TO THE MAIN SHAFT (APROX EVERY 5000 TO 10000 MILES) THIS OFTEN RESULTS IN A GREAT DEAL OF WEAR BETWEEN THE DISTRIBUTOR CAM AND THE MAIN SHAFT , ACCOUNTING FOR A LOT OF THE SLOPPINESS WE ARE GETTING IN OUR DISTRIBUTORS

ANOTHER LIKELY SPOT FOR AN OCCASIONAL BIT OF GREASE IS THE LUBE FITTING ON THE WATER PUMP , A REASONABLE AMOUNT OF CAUTION SHOULD BE USED AT THAT LUBE POINT FOR THE CAVITY IS QUITE SMALL AND OVERFILLING CAN PUSH THE SEAL OFF ITS SEAT. THERE IS A BUILT IN OVERFLOW HOLE IN THE CASEING , BUT YOU CAN'T ALWAYS COUNT ON THAT EXHAUSTING ALL THE EXCESS GREASE.

NO SERVICE OF A TR SHOULD BE ACCOMPLISHED WITHOUT LUBRICATING ALL THE POINTS N T THROTTLE LINKAGE , INCLUDING WHERE THE BELL CRANK PIVOTS BELOW THE FRONT CARBURETOR. IT ALWAYS AMAZES ME TO FIND OUT HOW MANY TRIUMPHS ARE RUNNING AROUND WITH THE BELL CRANK PIVOT SO BADLY WORN , SIMPLY BECAUSE THEY HAVE NEVER BEEN LUBRICATED. WHILE YOU ARE IN THAT PARTICULAR AREA WITH AN OIL CAN IN YOU GRUBBY LITTLE HAND , IT WOULD BE AN EXCELLENT TIME TO PUT A DROP OR TWO OF MOTOR OIL IN THE HOLE DRILLED IN THE BACK OF THE END PIECE OF THE GENERATOR THAT COMMUNICATES WITH THE END OF THE ARMITURE -- IT IS TRULY REMARKABLE HOW LONG THESE GENERATORS WILL LAST WITH AN OCCASIONAL DROP OF OIL

WHILE THESE ARE BY NO MEANS ALL THE OVERLOOKED LUBRICATION POINTS ON A TRIUMPH , IT WILL MOST CERTAINLY PROVIDE YOU WITH A GOOD STARTING POINT , AND IN THE MONTHS TO COME WE WILL COVER THE MATTER IN MORE DETAIL !

KEN GILLANDERS - VOLUME 32 , MARCH 1985

SUMMER APPROACHES ! (OR MORE ROUTINE MAINTANCE)

AS SUMMER APPROACHES IT IS PROBABLY A GOOD IDEA TO GO OVER A GOOD GENERAL MAINTANCE SCHEDULE TO AVOID AS MUCH TROUBLE AS IS POSSIBLE. THESE ARE GENERAL SERVICE IDEAS , BUT BY NO MEANS ARE THEY THE ONLY SATISFACTORY SCHEDULE FOR SERVICE . I WILL LIST THEM TO HELP YOU , BUT CHANGE ANY MILEAGE OR TIME PERIOD TO SUIT YOUR SCHEDULE OR THE CAR .

1). OIL AND FILTER CHANGE , AND CHASSIS LUBE . YOU SHOULDN'T EXCEED 3000 MILES , AND BE SURE TO USE GOOD QUALITY OIL . 20/50 WEIGHT SEEMS TO GIVE THE BEST SERVICE AND CAN BE USED YEAR ROUND. BE SURE TO CHANGE THE FILTER GASKET EVERY TIME. THE OIL SHOULD BE CHANGED WITH THE ENGINE AT OPERATING TEMPERATURES , THIS WILL PREVENT SEDIMENT FROM SETTLING OUT DON'T OVER GREASE THE CHASSIS LUBE FITTINGS AND BE SURE TO WIPE OFF THE FITTINGS BEFORE LUBEING.

2) VISUAL CHECK OF THE CHASSIS . THIS SHOULD BE DONE WHEN LUBING ; LOOK OVER THE CONDITION OF THE UPPER CONTROL ARM BUSHINGS . CHECK FOR LOOSENESS IN THE ROD ENDS AND BALL JOINTS , AND THE FIT OF THE SILENT BLOCS.

3) CHECK ENGINE CAMPARTMENT . WHEN CHANGING OIL AND FILTER ALSO CHECK THE FLUID LEVELS FOR THE BRAKES , CLUTCH , STEERING BOX , COOLANT , AND THE BATTERY (IF NOT SEALED) , AND THE OIL IN THE DASH POTS OF THE CARBS.

4) COOLENT . ABOUT EVERY 6000 MILES OR EVERY 18 MONTHS CONSIDER CHANGING THE COOLANT . THE BEST MIX IS 2 PARTS WATER TO 1 PART ANTI-FREEZE. CHECK ALL THE HOSES FOR CRACKS AND SOFTNESS . THIS IS A GOOD TIME TO GREASE THE WATERPUMP , IF IT HAS A NIPPLE , BUT DON'T OVERFILL !

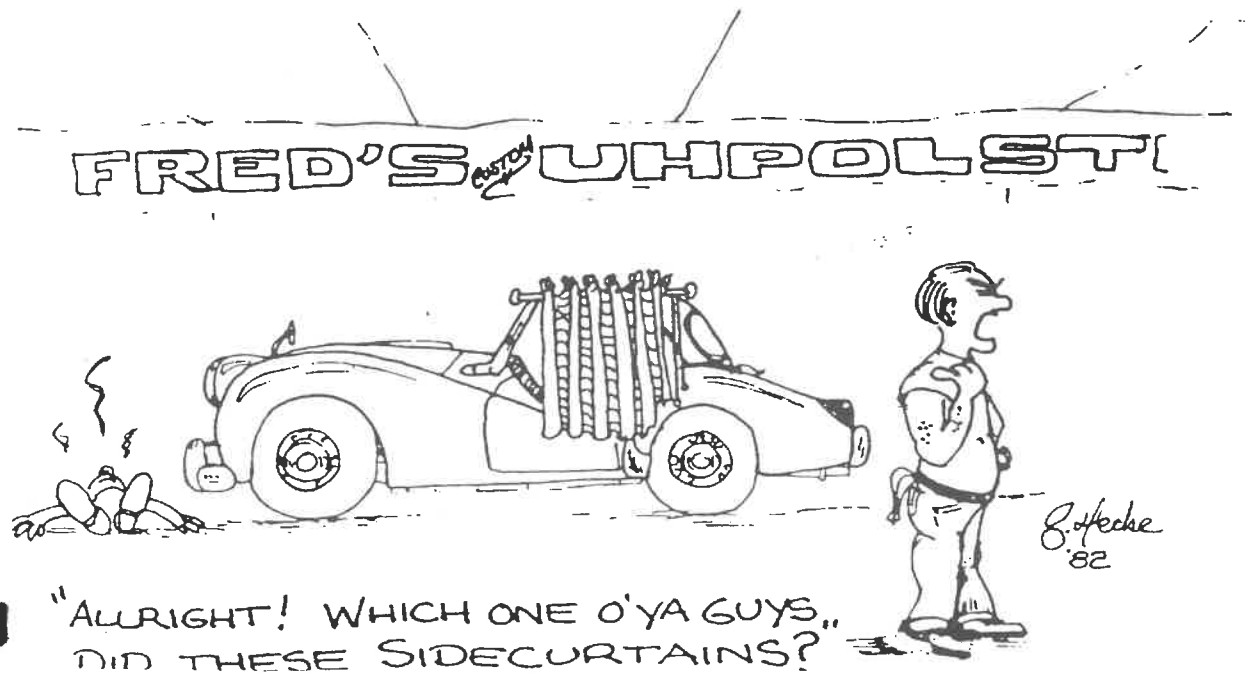
5) TRANSMISSION & DIFFERENTIAL . ABOUT EVERY 5000 MILES YOU SHOULD CONSIDER CHANGING THE GEAR OIL IN THE DIFFERENTIAL AND THE TRANSMISSION . A GOOD QUALITY GEAR OIL IN THE 80/90 WEIGHT RANGE SEEMS THE BEST. ON TRANSMISSIONS EQUIPED WITH OVERDRIVE , YOU SHOULD CONSIDER A GEAR OIL CHANGE SOONER , SINCE CLUTCH DETERIORATION POLLUTES THE OIL , CHECK FOR LEAKS , ESPECIALLY AROUND THE PINION SEAL.

6) BRAKES 10,000 MILES IS A GOOD GUIDE TO INSPECT THE BRAKES , LOOK FOR WORN LININGS AND PADS , CHECK WHEEL CYLINDERS FOR LEAKS , AS WELL AS AROUND THE MASTER CYLINDER . CHECK ALL BRAKE HOSES.

7) GENERAL OILING . TAKE YOUR OIL CAN AND LUBE , AT LEAST ONCE A YEAR -- MORE OFTEN WOULD BE BETTER IF THE CAR IS USED A LOT , AND OIL THE REAR BRUSH OF THE GENERATOR , OIL THE THROTTLE LINKAGE , DOOR LOCKS AND HINDGES , REAR LEAF SPRINGS , HAND BRAKE LINKAGE , AND UNDER THE DISTRIBUTOR ROTOR.

8) HIT THE REAR WHEEL BEARINGS WITH GREASE ABOUT EVERY 10,000 MILES.

KEN GILLANDERS - VOLUME 46 , JUNE 1986



179 "ALLRIGHT! WHICH ONE O'YA GUYS.. DID THESE SIDECURTAINS?

ETC , ETC , ETC .....

EVERY SO OFTEN I DO A SHORT COLUMN ON ITEMS THAT WOULD NOT MAKE AN ENTIRE COLUMN THEMSELVES.

1). WIRE WHEELS : YOU SHOULD NOT USE A HAMMER OF ANY TYPE DIRECTLY AGAINST THE KNOCK-OFF SPINNER WHETHER IT BE BRASS , LEAD , COPPER OR HIDE. ALL WILL CAUSE DAMAGE TO THE SPINNER EARS . I HAVE FOUND THAT A BLOCK OF HARD WOOD BETWEEN THE SPINNER AND THE HAMMER ALLOWS YOU TO TIGHTEN THE WHEEL SECURELY AND NOT DAMAGE THE SPINNER . TRADITIONALLY WHEEL BEARING GREASE OR CHASSIS GREASE HAS BEEN USED TO LUBRICATE THE SPLINES , BUT YOU CAN AVOID THE MESS ON YOUR WHEELS AND DO AS GOOD A JOB IF YOU WASH ALL THE OLD GREASE OUT AHD LUBRICATE THE SPLINES AND SPINNERS WITH VASELINE . DON'T GET CARRIED AWAY , A THIN FILM WORKS JUST AS GOOD AS STUFFING THE CAVITY FULL !

2) HEADLIGHTS . IF YOU ARE NOT SATISIFIED WITH THE BRIGHTNESS OF YOUR HEADLIGHTS , THEY CAN BE REPLACED WITH HALAGENS . THEY ARE 40 PERCENT BRIGHTER AND DRAW ABOUT THE SAME CURRENT , THEY ARE ALSO A DIRECT REPLACEMENT AND DO NOT REQUIRE MODIFICATION.

3) ROADSIDE REPAIRS . KEEP A ROLL OF PLASTIC ELECTRICAL TAPE IN YOUR GOLVE BOX , IT COMES IN HANDY TO MAKE TEMPORARY REPAIRS ON LEAKING HOSES . IT IS A GOOD IDEA TO ASSEMBLE A HIGHWAY BREAKDOWN KIT , USUALLY A SMALL BOX WITH A COUPLE OF FUSES , ELECTRICAL TAPE , A SELECTION OF MISC. BOLTS , NUTS , WASHERS AND STUDS . ALSO CARRY A SPARE SET OF POINTS , A ROTOR , CONDENSOR , AND A CAP (IF ROOM ALLOWS) . A SMALL CAN OF BRAKE FLUID , SHORT LENGTHS OF ELECTRICAL WIRE , AND I'M SURE , THERE ARE MANY OTHER GOOD SUGGESTIONS TO ADD TO THIS AS THERE ARE CLUB MEMBERS.

4) STARTERS . THE STARTER DRIVE BUSH ASSEMBLYS FOR THE EARLY STARTERS HAVE BEEN DELIVERED . ANYONE INTERESTED CONTACT ME AT (818) 488 - 3431

KEN GILLANDERS - VOLUME 47 , JULY 1986

UPDATES !

FROM TIME TO TIME IT BECOMES NECESSARY TO REPAIR OUR TR'S , BUT SOMETIMES THE OBVIOUS REPAIR IS NOT THE BEST OPTION RO THE MOST EFFECTIVE.

TRANSMISSION TROUBLES : THE TR2 , TR3 AND TR3A HAD A 4 SPEED GEAR BOX WITH NON-SYNCRO AND FRAGILE 1ST GEARS . THEY WILL USUALLY FAIL WHEN A TOOTH BREAKS OFF THE COUNTER GEAR , AND YOU DEVELOPE A KNOCK IN BOTH 1ST AND REVERSE GEARS THE BEST REPAIR IS TO REPLACE THE GEAR BOX WITH ONE FROM A TR4A , TR250 , OR AN EARLY TR6 . IT REQUIRES THAT YOU ELONGATE THE HOLES IN THE CROSS MEMBER TOWARDS THE REAR ABOUT 5/8" TO 3/4" AND CLEAR THE STARTER BLUDGE ON THE BELL HOUSING BY DENTING THE TUNNEL .

REPAIRS TO THE ORIGINAL TRANSMISSION ARE IMPRACTICAL AS THE SUPPLIES OF SPARES ARE VERY LIMITED . TO THE BEST OF OUR KNOWLEDGE , THERE ARE NO MORE COUNTER GEARS OR COUNTER SHAFTS FOR THE EARLY BOXES AND THEY ARE ABOUT TO BE JOINED BY THE 1ST GEAR ASSEMBLY.

DIFFERENTIAL TROUBLES : TR2 AND TR3 THROUGH ABOUT 1965 HAD THE EARLY MAYFLOWER TYPE REAR AXEL . WHILE THE GEARS AND DIFFERENTIAL CARRIER ASSEMBLY IS THE SAME AS THE LATER UNIT , THE AXEL SHAFTS AND OUTER BEARINGS ARE VERY WEAK , LEAK GEAR LUBRICANT AND ARE VERY HARD TO FIND . THE MOST PRACTICAL WAY TO REPAIR THEM IS TO REPLACE THEM WITH THE LATER VANGUARD BASED TR3A AND TR3B UNIT . THIS IS ANOTHER DIRECT "BOLT IN" EXCHANGE AND IS BOTH STRONGER AND EAISER TO SERVICE.

CRANKSHAFTS : THE TR2 AND THE EARLY TR3 CRANKSHAFT WAS NOT CROSS DRILLED , AND WAS GENERALLY OF LESSER MATERIAL THAN THE LATER CRANKSHAFTS . WITH THE CRACKING AND BREAKING PROBLEMS IT WOULD BE BEST TO USE A LATER UNIT , BUT HAVE THEN MAGNAFLUXED AND SHOT PEENED BEFORE USING.

KEN GILLANDERS - VOLUME 50 , OCTOBER 1986

BOLTS , NUTS , & THINGS

ABOUT FOR OR FIVE YEARS AGO TRSC WENT TO CAMBRIA FOR THE WEEKEND , AND ON THE DRIVE HOME THE RED ROCKET BROKE ONE OF THE STUDS THAT HOLD DOWN THE ROCKER ARM SHAFT !

NOW , MARTY LODAWER IS NOT THE ONE TO ALLOW SOMETHING LIKE THAT TO GO UNNOTICED , HE BEGAN CARRYING A SPARE ! SURE ENOUGH , SEVERAL YEARS LATER , MARTY BROKE ONE TOO ! THE PROBLEM HAS CONTINUED TO GROW , AND IF IT HASN'T HAPPENED TO YOU YET , JUST WAITE !

ON JULY 30 (1988) THE TR REGISTER UK STAGED A VINTAGE RACE AT SPA IN BELGUIM , AND DARRYL UPRICHARD WAS LEADING THE TR CONTIGENT BROKE A ROCKER STUD . WELL WHEN OUR RACE CARS START TO BREAK , IT'S TIME TO DO SOMETHING ! AS WITH THE HEAD NUTS , I APPROACHED BOWMAN PRODUCTS FOR A SOLUTION , AND AS USUAL , THEY CAME THROUGH WITH FLYING COLORS . WE ALWAYS CONSIDERED THE PROBLEM TO BE OLD AGE AND FATIGUE -- WE WERE HALF RIGHT . I HAD AN UNUSED STOCK STUD AND A BROKEN STUD , AND FOUND OUT : 1) THE ORIGINAL STUD WAS ABOUT GRADE 3 , 2) THE FATIGUE COMES ABOUT AS A COMBINATION OF STRECHING THE STUD WHILE TIGHTENING AND MOVEMENT OF THE ROCKER ARM ASSEMBLY . THE SHAFT IS PUT ON WITH ALL KINDS OF LASH UPS ON TOP OF THE ROCKER STANDS , SOME WITH JUST NUTS , SOME WITH LOCK WASHERS AND NUTS , AND SOME WITH FLAT WASHERS , LOCK WASHERS , AND NUTS

THE LAST IS WHAT BOWMAN RECOMMENDS AS THEY ALSO RECOMMEND THE USE OF GRADE 8 STUDS AND A GRADE 8 FLAT WASHER . WE HAVE SECURED A SUPPLY OF THE GRADE 8 STUDS AND FLAT WASHERS WHICH WILL BE PACKAGED 4 EACH FOR ABOUT $8 BOWMAN RECOMMENDS THAT THE COURSE THREADED END OF THE STUD SHOULD BE TIGHTENED TILL IT BOTTOMS (THERE SHOULD BE ABOUT 3 THREADS SHOWING ABOVE THE HEAD) , THEN INSTALL THE ROCKER ASSEMBLY AND PLACE A GRADE8 FLAT WASHER OVER EACH STUD , AND THEY FEEL A 3/8" LOCK WASHER SHOULD BE USED OVER THE FLAT WASHER . GOOD QUALITY GRADE 5 OR 8 3/8" X 24 THREAD NUTS SHOULD BE TORQUED TO 30 FT LBS TO PREVENT MOVEMENT SOMETIMES THE TOP OF THE ROCKER STAND IS IN VERY POOR CONDITION DUE TO THE USE OF NUTS OR NUTS AND LOCK WASHERS WITHOUT THE FLAT WASHER . DO EITHER OF THE FOLLOWING TO REPAIR THE PROBLEM . 1) MACHINE THE TOP SURFACE OF THE ROCKER STAND AND USE TWO FLAT WASHERS ON TOP OF THE STAND , 2) REPLACE THE ROCKER STAND WITH NEW OR GOOD USED.

KEN GILLANDERS - VOLUME 67 , SEPTEMBER 1988

SCREWS LOOSE ?

A COMMON PROBLEM ON THE TR2 , TR3 , AND EARLY TR3A MODELS IS THE LIFT A DOT PEGS ALL AROUND THE COCKPIT OF THE CAR BECOMMING LOOSE AND FALLING OUT . THIS GENERALLY HAPPENS BECAUSE THE HOLES , MOST OF WHICH GO THROUGH WOOD , BECOME ENLARGED . THEY CAN BE REPAIRED BY A COUPLE OF METHODS.

1) WOODEN MATCHSTICKS OR TOOTHPICKS CAN BE COATED WITH WHITE GLUE AND THEN A COUPLE STUFFED INTO THE HOLE , BREAKING OFF THE EXCESS LENGTH SO THAT THE ENDS ARE FLUSH WITH THE HOLE . ALLOW TO DRY FOR AN HOUR OR SO , THEN THE PEGS CAN BE SCREWED BACK INTO THE HOLES WHERE THEY WILL FIT SOLIDLY . SOMETIMES IT'S HELPFULL TO DRILL A SMALL PILOR HOLE A SHORT DISTANCE INTO THE CENTER TO HELP GET THE PEG STARTED.

2) AN ALTERNATIVE METHOD IS TO TAKE A SMALL PIECE OF STEEL WOOL AND WRAP IT AROUND THE THREADS OF THE PEG . THIS SHOULD ALSO TIGHTEN UP THE FIT OF THE PEG.

MARTY LODAWER - VOLUME 89 , OCTOBER 1990

BEEN LOOKING FOR A STUD ? OR THE CROME STRIP BLUES

MOST OF US WHO OWN TR3'S OF THE SMALL MOUTH VARITY HAVE , AT ONE TIME OR ANOTHER , TRIED TO DISMANTLE THE CROME MOLDING THAT SURROUNDS THE GRILL OPENING . A VERY COMMON PROBLEM WE HAVE EXPERENCED IS THAT THE STUDS WHICH ATTACH THE MOLDING TO THE FRONT APRON ITSELF ARE OFTEN RUSTED SOLID AND WILL BREAK DURING THE COURSE OF REMOVAL . NOW WE ARE LEFT WITH THE DILEMMA OF NOT ENOUGH STUDS TO RE-ATTACH THE MOLDING . THESE PIECES HAVE BEEN VERY HARD TO FIND.

FROM MEMBER MARK BENTOW COMES THE SOLUTION ! MARK POINTED OUT TO ME THAT THE STUD USED FOR ATTACHMENT OF MGB CROME SIDE MOLDING WILL WORK PERFECTLY IN THIS APPLICATION AND IS READILY AVAILABLE . THE BRASS PLATE OF THE MGB STUD IS SLIGHTLY RECTANGULAR INSTEAD OF SQUARE AS IS THE ORIGINAL ; BUT IT WILL STILL FIT PERFECTLY WITHIN THE CROME MOLDING . A TOTAL OF NINE OF THESE STUDS ARE REQUIRED TO ATTACH THE UPPER AND LOWER MOLDING PIECES . THEY SHOULD BE AVAILABLE FROM MG SUPPLIERS SUCH AS MOSS MOTORS AND THE ROADSTER FACTORY .

THANKS FOR THE TIP MARK !

THE FACTORY PART NUMBER IS AHH6360 AND THE PART IS CALLED 'PLATE & STUD'

MARTY LODAWER - VOLUME 60 , NOVEMBER 1990

BRAKE TIME

EVERY DRAWING OR CATALOG I'VE EVER SEEN SHOWS HOW THE REAR BRAKE SHOES ARE HELD AND STABILIZED BY AN ASSEMBLY CONISTING OF A "NAIL" , SPRING AND WASHER . ON ONE OF MY COUNTLESS ORDERS (I OWN PART OF THE ROADSTER FACTORY) (ED. -- WE ALL HAVE A PIECE OF THAT OPERATION !) , I ADDED ALL THESE THINGS TO MY LIST , AND ONCE RECEIVED , COULDN'T SEE HOW THEY COULD POSSIBLY FIT . THE BACKING PLATES ON MY CAR HAVE THESE STRANGE LITTLE BOLTS WITH A JAM NUT IN PLACE OF WHERE THE 'NAI' ASSEMBLY WOULD HAVE BEEN . I'M NOT SURE WHEN , BUT AT ONE POINT DURING PRODUCTION THIS BOLT WAS REPLACED BY THE MORE FAMILIAR NAIL AND SPRING .

THIS WHOLE THING CONFUSED ME (MORE SO THAN USUAL) AND I TURNED TO MR. GILLANDERS FOR SOME INSIGHT VIOLA ! ! WAS RELIEVED TO LEARN THAT THE MYSTERY BOLT WAS NOT A MAKESHIFT "QUICK FIX" BY SOME PREVIOUS OWNER , BUT ACTUALLY USED ON SOME CARS THE DIAGRAMS WILL BE HELPFUL DURING YOUR NEXT BRAKE INSPECTION CHECK YOUR SET-UP , AND SEE IF YOU DO HAVE THE BOLTS , HERE ARE SOME DETAILS YOU'LL WANT TO "SUS OUT" .

FIRSTLY , THE BOLT SHOULD HAVE A SMALL FELT "CAP" ON IT WHICH ACTS AS A BUFFER BETWEEN THE BRAKE SHOE AND THE FLANGE NORMALLY , THIS LITTLE GUY IS GONE OR BADLY WORN , SO A SMALL SECTION OF RUBBER HOSE THAT WILL PUSH ON THE BOLT WILL WORK FINE . BE SURE IT STICKS OUT ABOUT 1/16" PAST THE END OF THE BOLT . NEXT , YOU WILL HAVE TO ADJUST THE BOLT SO THAT THE BRAKE SHOE IS "SQUARED" TO THE HUB PLATE AND THE BRAKE DRUM , THEN TIGHTEN THE NUT WHEN IT'S RIGHT.

USING A RULER , YOU CAN MEASURE THE DISTANCE BETWEEN THE BACKING PLATE AND VARIOUS PLACES ON THE BRAKE SHOE TO ALIGN IT PROPERLY ... ADJUST THE BOLT UNTIL ALL MEASUREMENTS ARE THE SAME . AS FAR AS I KNOW , THE NAIL AND SPRING TYPE DOESN'T ADJUST - IT ALIGNED ITSELF AUTOMATICLY . THAT'S IT FOR NOW .. SEE YA AT DEL MAR PROVIDING THE WRENCH GODS ALLOW MY CAR TO BE COMPLETED)

JOHN COLE - VOLUME 58 , OCTOBER - NOVEMBER 1987

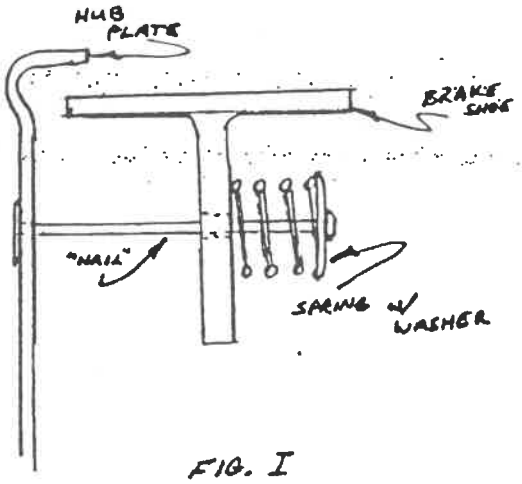

HUB PLATE
BRAKE SHOE
"NAIL"
SPRING W/ WASHER

FIG. I

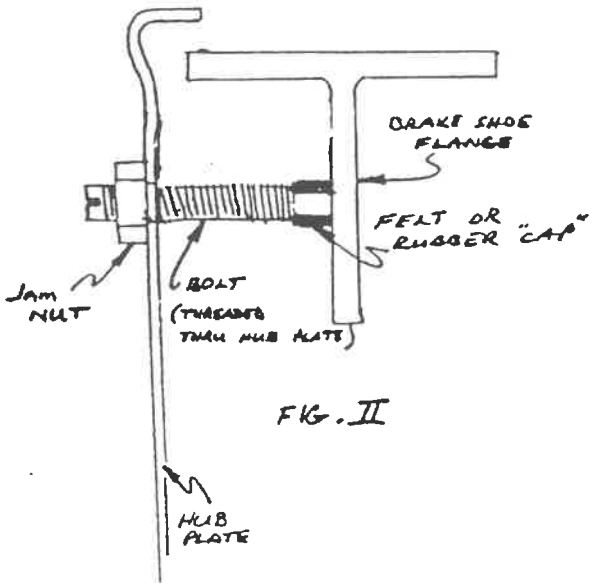

BRAKE SHOE FLANGE
FELT OR RUBBER "CAP"
JAM NUT
BOLT
(THREADS THRU HUB PLATE)
HUB PLATE

FIG. II

SIDECURTAINS THAT FIT (BETTER)

WELL , I'M BACK AGAIN , THIS TIME WITH A LITTLE DISCUSSION ON EVERYONE'S FAVORITE SUBJECT : SIDECURTAIN'S !

FRANKLY , I NEVER GAVE THE AREA A LOT OF THOUGHT , YOU GOT YOUR CAR ON THE ROAD AND DROVE IT 'TILL THAT BLAST OF AIR ON THE SIDE OF YOUR FACE FORCES YOU TO GET SIDECURTAINS ORDERED .

YES , THE NEW ONES DO LOOK NICE AND SEEM TO BE MADE QUITE WELL , BUT THE FIT LEAVES A LITTLE TO BE DESIRED . PROBABLY THE MOST COMMON COMPLAINT IS THE CONSTANT ROAR YOU HAVE TO DEAL WITH AT SPEEDS ABOVE 40 MPH . FOR THE LAST TWO YEARS I'VE HEARD THE SAME COMMENT FROM EVERYONE , "THAT'S JUST THE WAY THEY FIT" , AND "THE FACTORY ONES DIDN'T FIT ANY BETTER " SOUND FAMILIAR ? I BOUGHT IT !

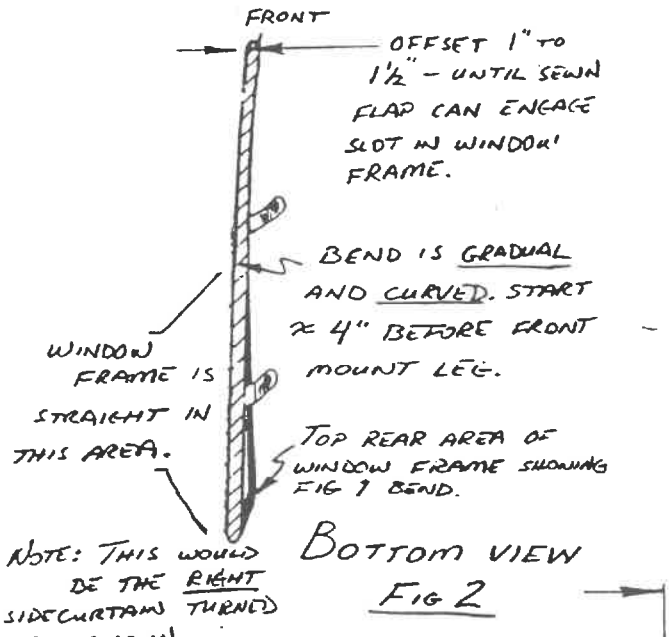
GUESS WHAT I HAVE BEEN DISCUSSING WITH A FRIEND IN SAN DIEGO --- RIGHT - SIDECUTRAINS ! WE HAD THE OPERTUNITY TO COMPARE HIS ORIGINAL SETS (4 TOTAL) WITH MY REPRODUCTIONS. AFTER A SIDE BY SIDE COMPARISON , USING A YARDSTICK , PROTRACTOR AND A NOTE PAD , WE CAME ACROSS SOME VERY INTERESTING DETAILS.

THE FOLLOWING ARE MY OBSERVATIONS AND IDEAS ONLY , FOLLOW THEM UNDER THE SUPERVISION OF AN ADULT AND BELIEVE ONLY WHAT YOU WANT !

FIRST , AS A POINT OF REFERENCE , THE NEW REPORS AVAILABLE ARE NEARLY EXACT IN PROFILE SHAPE AND DIMENSIONS . MOUNTING LEGS VARY SLIGHTLY IN LENGTH AND CONTURE , BUT ARE CLOSE ENOUGH . THE ACTUAL WINDOW AND BOTTOM PANEL FRAME IS COMPLETELY FLAT - WHICH IS WHERE WE BEGIN TO SEE DIFFERENCES WITH THE ORIGINAL . REFER TO THE DRAWINGS FOR DETAILS . MAKE ALL BENDS SLOWLY AND HAVE A STRAIGHT EDGE HANDY FOR KEEPING TRACK OF YOUR ANGLES . USE LEVERAGE TO BEND . DON'T DO THIS WHILE IT IS ON THE CAR , USE A TABLE TOP OR ANYTHING THAT WILL HELP YOU FROCE THE FRAME TO SHAPE . THE FLAP ON THE FRONT RAIL OF YOUR SIDECUTRAINS SHOULD FIT INTO THE SLOT BETWEEN THE WINDSHIELD STANCHION AND THE FLAT PLATE MOUNTED TO IT .

CONFUSED ? BUY A TR4 !

NOTE : ALL MEASUREMENTS ARE APPROX., TAKEN FROM 4 DIFFERENT ORIGINAL SIDECURTAIN ASSEMBLIES.



BOTTOM VIEW
FIG 2

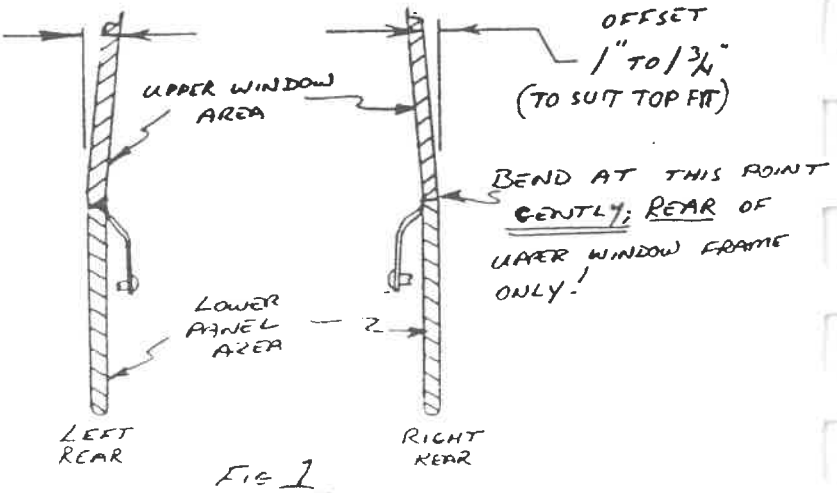


FIG 1

OUT WITH THE HAMSTER , ON WITH THE HEAT !

AS MUCH AS WE ENJOY OR TR2/3 ROADSTERS , A BIG IMPROVEMENT FOR THE CAR IS A BETTER HEATER . I FOUND A HEATER OFFERED BY J.C. WHITNEY . IT IS EASY TO INSTALL AND PRODUCES TWICE THE HEAT AS MY OLD ORIGINAL SMITHS HEATER . ONE DISADVANTAGE IS , THERE IS NO EASY WAY TO ATTACH THE WINDSCREEN DEFROSTER HOSES , BUT I NEVER USE THE DEFROSTER ANYWAY ! IF THE CAR IS USED WITH SIDECURTAINS AND THE TOP IN COLD DAMP WEATHER , THE LACK OF A DEFROSTER WO') BE MORE OF A PROBLEM .

THE CATALOG NUMBER IS 514J . THE ADD READS , "HEAVY DUTY STANELESS STEEL HEATER" , NUMBER 54-1409X 12 VOLT . FOUND ON PAGE 15 OF MY LATEST CATALOG AND THE COST WAS $98.96.

PERHAPS THE TOUGHEST PART OF THE INSTALLATION OF THE NEW HEATER IS GETTING THE OLD ONE OUT ! THE NEW HEATER IS BOLTED TO THE BACK OF THE BATTERY BOX UNDER THE DASH . FIRST SET THE HEATER ON THE BENCH WITH THE IN & OUT WATER PIPES ON THE BOTTOM AND TO THE RIGHT SIDE . NOW YOU NEED TO MAKE A PAPER TEMPLATE OF THE 4 HOLE PATTERN ON THE BACK SIDE OF THE HEATER ; MARKING TOP , LEFT AND RIGHT REMOVE THE BATTERY AND PLACE THE PAPER AGAINST THE BACK OF THE BATTERY BOX FROM UNDER THE BONNET TAKE NOTE OF TOP , LEFT AND RIGHT SO THE TEMPLATE IS POSITIONED THE SAME AS THE HEATER . POSITION THE TEMPLATE SO THAT THE HOLES ARE 4" DOWN FROM THE BEND OF THE BATTERY BOX. MARK THE HOLES AND DRILL WITH A 5/16" BIT . NOW YOU ARE READY TO BOLT THE HEATER INTO PLACE , USING 1/4 X 20 X 1/2" LONG BOLTS . POSITION THE HEATER WITH THE WATER PIPES ON THE BOTTOM AND TO THE RIGHT I USED A PIECE OF SMALL ANGLE IRON AS A CROSS BRACE ON THE FRONT SIDE OF THE HEATER , I BOLTED IT TO THE HEATER AND TO THE STRUTS UNDER THE DASH . THE WATER PIPES ON THE HEATER ARE 5/8" IN DIAMETER AND THE CAR USES 1/2" DIAMETER HOS SIZE . I WAS ABLE TO PUCH NEW 1/2" HOSE ON THE 5/8" HEATER WITH A LITTLE ARMOR-ALL . BE SURE TO USE GOOD HOSE CLAMPS TO KEEP THE HOSES SECURELY IN PLACE TO PREVENT LEAKS.

TO INSURE THE FULL PERFORMANCE OF THE NEW HEATER, BE SURE THE HOT WATER IS ADEQUITE . CHECK THE HOT WATER TUBES RUNNING THROUGH THE FIREWALL FOR RUST AND BLOCKAGE , I REPLACED THESE BECAUSE I FOUND MINE PARTLY BLOCKED.

OUR CAR IS EQUIPED WITH A 180 THERMOSTAT , BUT IN COLD WEATHER I FIND IT NECESSARY TO COVER 30 TO 40 PERCENT OF THE RADIATOR TO MAKE THE ENGINE RUN UP TO TEMPERATURE SO THE HEATER PERFORMS WELL . I WIRED IT TO THE ORIGINAL ROTATING VARIABLE SPEED SWITCH ON THE DASH , AND THIS SEEMS TO WORK FINE

OUR NEW HEATER HAS MADE OUR TR MORE COMFORTABLE AND ENJOYABLE IN COLD WEATHER

DARYLL CLARK - VOLUME 82 , FEBRUARY 1990

HEATER WITH DEFROSTER I

AFTER READING DARYLL CLARK'S ARTICLE ABOUT HIS INSTALLATION OF A MORE POWERFUL HEATER , I GOT OUR MY J.C. WHITNEY CATALOG TO LOOK UP THE HEATER HE USED.

BEING FROM A MORE NORTHERN CLIME , I DECIDED THAT I NEEDED DEFROSTER CAPABILITY, AND FOUND IT ! IT COSTS A LITTLE MORE AND ITS OUTPUT IS 20,000 BTU INSTEAD OF THE 12,500 BTU DARYLL USED , BUT IT HAD HOLES IN ITS SIDES FOR DEFROSTER HOSES . CATALOG #518J , #54-1421B , PAGE 10 . IN THE NEW CATALOG THEY OFFER A DEFROSTER KIT , BUT THEY DIDN'T WHEN I ORDERED , AND IT COSTS ANOTHER $23.

SINCE I HAD NO HARDWARE FOR THE DEFROSTER I PUT THE HEATER ON THE COFFEE TABLE AND LOOKED AT IT FOR A WEEK OR TWO HOPING IT WOULD TELL ME HOW TO ATTACK THE PROBLEM OF THE DEFROSTER HOSES , WHICH ARE A MUCH SMALLER DIAMETER THAN THE OUTLETS ON THE HEATER BODY . THEN , ONE DAY , WHILE SETTING UP A TRAIN SET FOR MY NEPHEW , IT CAME TO ME ! THE SPOOL THAT HOLDS SPEAKER WIRE IS THE SAME INSIDE DIAMETER AS THE HOSES ALREADY IN THE TR. I RAN DOWN TO THE GARAGE , SCOOPING UP THE HEATER FROM THE COFFEE TABLE . I MEASURED THE DIAMETERS OF THE SPOOL AND THE HOSE AGAIN TO MAKE SURE THEY WOULD FIT. I THEN CUT THE SPOOL IN HALF TO MAKE TWO NOZZLES FOR THE HOSES . THE OUTLETS OF THE HEATER WERE VERY CLOSE TO ONE SIDE OF THE HEATER BODY MAKING IT NECESSARY TO

CUT OFF A PORTION OF THE LARGE RIGN OF THE SPOOL . THEN I DRILLED AND RIVITED THE SPOOL HALVES TO THE INSIDE OF THE HEATER BODY.

THE HEATER IS QUITE LARGE , SO SOME MINOR MODIFICATIONS HAD TO BE MADE TO ITS MOUNTING BOLTS AND THE WATER PIPES. THE BOLTS I JUST CUT OFF AND THE HOSE ATTACHMENTS HAD TO BE SHORTENED ALMOST 3/8" . THE HEATERS SIZE (8 2/32H X 8 7/16W X 8 3/4D) MADE IT CLEAR THAT IT WOULD HANG BELOW THE DASH BY ALMOST THREE INCHES . AFTER MAKING THESE CHANGES , I WENT TO WORK REMOVING THE STOCK HEATER , WHICH IS AS HARD AS PUTTING ONE IN , HAVING TO REMOVE THE GLOVE BOX FOR A LARGER WORK SPACE . I ATTACHED THE WATER HOSES TO THE HEATER AND THEN MOVED THE UNIT INTO THE SPACE THE OLD ONE OCCUPIED JUST A FEW SHORT HOURS BEFORE . THE NEXT STEP WAS TO MAKE A STRAP TO HOLD THE HEATER IN PLACE . I USED PLUMBERS STRAP , WHICH ATTACHED TO THE TWO DASH SUPPORTS AND TO THE HEATERS INSPECTION COVER BY WAY OF SELF-TAPPING SCREWS. THE ONLY REAL PROBLEM WAS THE OIL PRESSURE LINE INSIDE THE COCKPIT WOULD NOT ALLOW THE HEATER TO GO AS HIGH AS I WOULD HAVE LIKED.

THEN THE WATER HOSES WERE ATTACHED TO THE TUBES THAT GO THROUGH THE FIREWALL . NEXT I RAN A LEAD FRON THE IGN. SIDE OF THE FUSE BOX TO THE HEATER SWITCH ON THE DASH . SO THAT THE MAIN AIR OUTLET OF THE HEATER COLSED TIGHTLY I PUT ON A SHOWER DOOR LATCH , THIS DID THE TRICK.

THE DRIVERS SIDE DEFROSTER HOSE REACHED WITH A FEW INCHES CUT OFF THE LENGTH BUT THE OTHER SIDE NEEDED ANOTHER MODIFICATION . THE OUTLET IS NOW AT THE FRONT OF THE UNIT RIGHT BEHIND THE DASH AND REGULAR INSTALLATION OF THE DEFROSTER HOSE WOULD INTERFER WITH THE GLOVE BOX. I AGAIN WENT TO THE PLUMBING STORE AND GOT A PVC ELBOW TO ATTACH TO THE OUTLET SO THAT THE HOE NOW . ACED THE UNDERSIDE OF THE BODY TUB , UNDER THE DASH . THEN THE HOSE HAD TO BE SHORTENED AND THE GLOVE BOX HAD TO HAVE A SMALL PORTION CUT AWAY , THEN THE WORK WAS DONE !

THE DOORS OF THE HEATER ARE GREAT , ONE FACES DOWN AND PUTS HOT AIR ON THE TOP OF THE TRANS TUNNEL AND THE OTHER TWO ARE JUST INSIDE THE DASH SUPPORTS AND ALLOW A GOOD FLOW OF AIR TO THE UPPER BODY.

(CONTINUED)

DEFROSTER continued ....

THIS INSTALLATION IS NOT THAT HARD AND THIS HEATER IS GEALLY GREAT FOR THOSE COLD DAYS ; AND MOST IMPORTANT , IT KEEPS THE WINDSHIELD CLEAR !

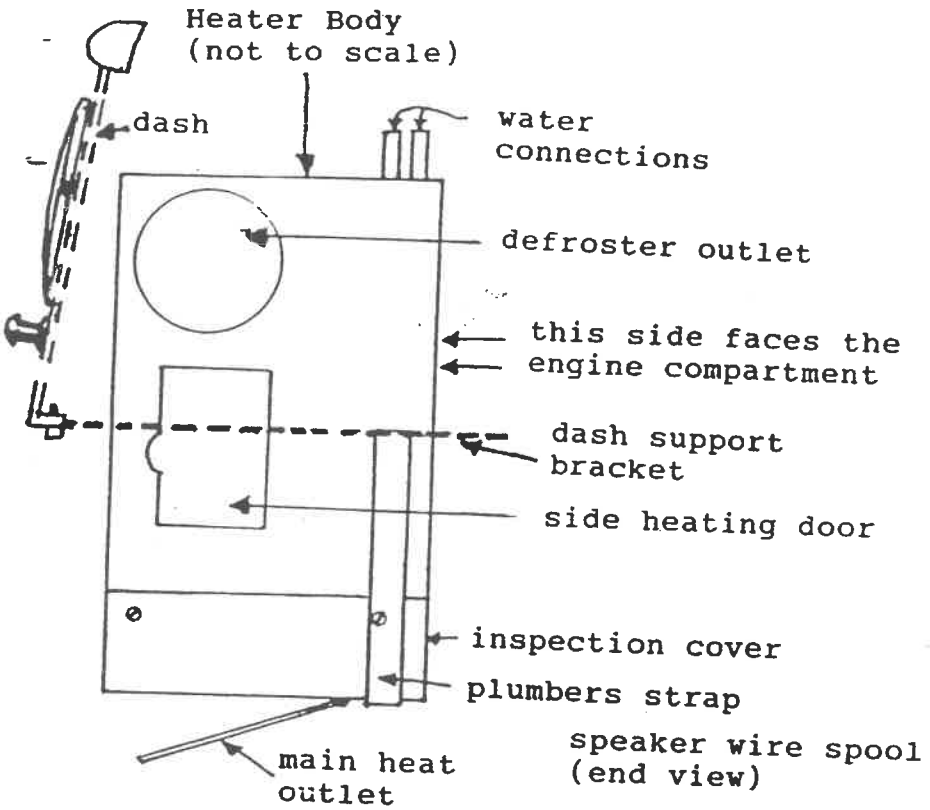
JON KORBIN - VOLUME 86 ; JUNE 1990

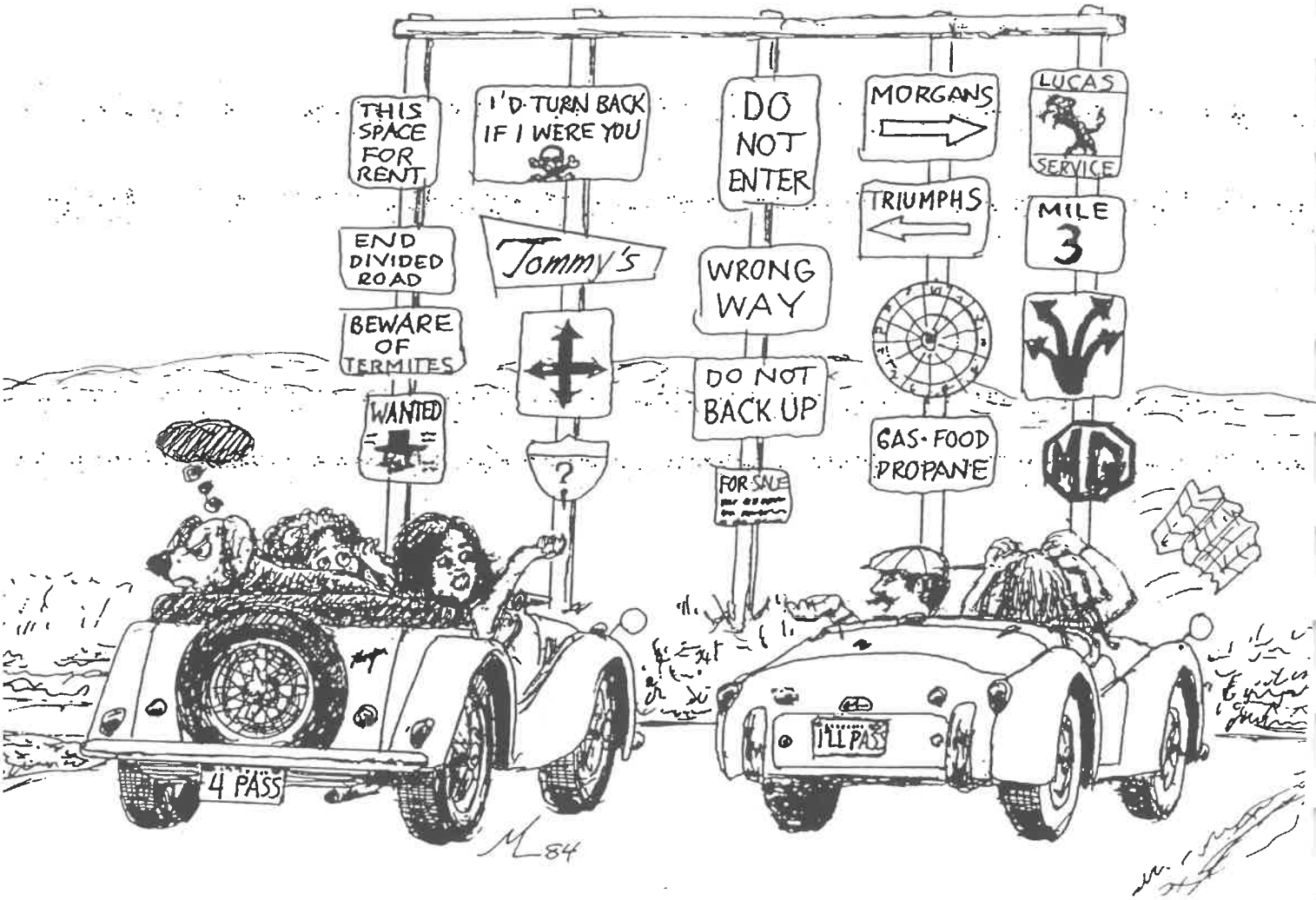
TECHNICAL AMENDMENT

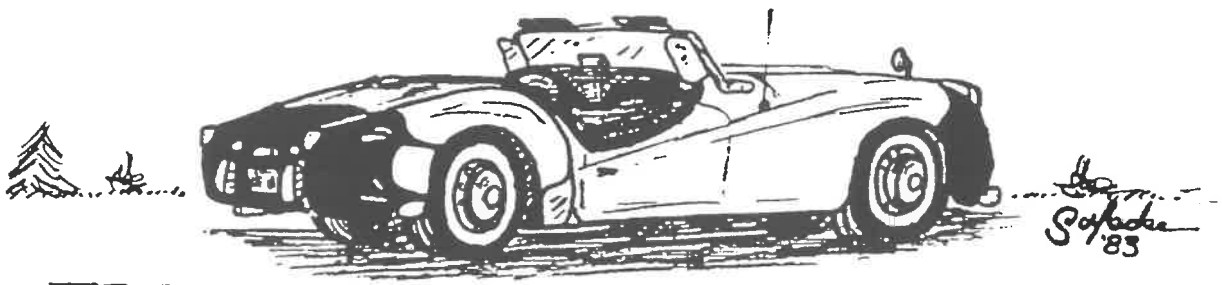
AFTER ONE SEASON OF DRIVING IN THE RAIN AND SNOW WE HAVE TAKEN THE CAR IN FOR BODY AND PAINT WORK - I TOOK OUT THE HEATER ALONG WITH A LOT OF OTHER STUFF AND DISCOVERED THAT THE PLASTIC WIRE SPOOL HAD BEEN AFFECTED BY THE HEAT PRODUCED BY THE UNIT -- THEY MELTED !

SO I HAVE GONE BACK TO THE PLUMBING STORE AND FOUND A LARGE ALUMINUM NUT THAT FIR THE HOLE AND THEN A GALVINIZED ELBOW TO ATTACH THE DEFROSTER HOSES TO , AT THIS TIME IT IS NOT RE-INSTALLED - THE TR IS STILL AT THE BODY SHOP !

JON KORBIN







TR3 WITH BRA & PANTIES

HOME BAKED ENAMEL

MANY PART OF OUR TR'S , INCLUDING THE SUSPENSION , WERE PAINTED AT THE FACTORY WITH A VERY DURABLE ENAMEL COATING THAT WAS BAKED AFTER APPLICATION : THIS BAKED ENAMEL GENERALLY HOLDS UP VERY WELL OVER THE YEARS , BUT DURING THE COUSE OF A REBUILD OR RESORTATION YOU MAY WANT TO RENEW THIS FINISH . I AM CURRENTLY DOING A GROUND UP RESTORATION OF A '57 TR3 AND I'VE COME UP WITH A PRETTY GOOD METHOD OF DUPLICATING THE FACTORY FINISH ON THE SUSPENSION MEM ~RS . THIS "RECIPE" IS A VARIATION OF ONE I GOT FROM THE VTR NEWSLETTER OF SEVE AL YEARS BACK . THE METHOD INVOLVES A LOT OF HAND WORK , BUT CAN BE DONE WITH SUPPLIES AVAILABLE TO THE AVERAGE AUTO HOBBIEST BE CAREFUL , THIS PROCESS INVOLVES USING SOME STRON CHEMICALS , FLAMABLE LIQUIDS , AND A PROPANE TORCH ALWAYS WORK IN A WELL VENTILATED AREA , WEAR GOLVES AND A FACE SHIELD WHEN NECESSARY , CAP OR RE-SEAL CONTAINERS WHEN NOT IN USE , AND HAVE A FIRE EXTINGUISHER HANDY . MOST IMPORTANT , USE YOUR HEAD AND WORK CAREFULLY .

I LIKE TO WORK ON A NUMBER OF PARTS AT ONE TIME , SUCH AS A FRONT SUSPENSION CORNER . IT'S MORE EFFICIENT , AND EASIER TO KEEP TRACK OF WHAT STAGE YOU'RE AT N THE PROCESS . I TYPICALLY SPREAD THIS PROCESS OUT OVER SEVERAL DAYS .

FIRST OF ALL , AND MOST PROBABLY THE MOST IMPORTANT , THE PIECES TO BE COATED MUST BE ABSOLUTELY CLEAN AND FREE OF DIRT AND GREASE OR OIL . THE PARTS MAY BE CLEANED IN ANY NUMBER OF METHODS , SAND OR SHOT BLASTING , CHEMICAL STRIP , OR WITE WHEEL . I USE A COMBINATION OF CHEMICALS AND WIRE WHEEL . FOR BEST RESULTS, FIRST SCRAPE OFF ANY LARGE GLOBS OF DIRT OR GREASE AND REMOVE ANY GREASE FITTINGS OR OTHER PARTS (REMOVE BUSHINGS , IF THE ARE GOING TO BE REPLACED) . THEN DIP THE PARTS IN A LARGE CAN OF PARTS CLEANER (5 GALLON CANS ARE ~VAILABLE) AND LET SOAK FOR 48 HOURS . I MADE UP A BUNCH OF WIRE HANGERS TO SUSPEND THE PARTS IN THE CAN SO THEY WOULD BE EASY TO REMOVE . WARNING ! PARTS CLEANER IS NASTY STUFF , BE CAREFUL NOT TO GET IT ON YOUR HANDS OR CLOTHES , AND ESPECIALLY YOUR EYES. WEAR GLOVES AND A FACE SHIELD OR SAFETY GLASSES . REMOVE THE PARTS AND LET THE EXCESS CLEANER DRAIN , THEN RINSE THE PARTS THOROUGHLY WITH WATER . NOW , BY USING A WIRE WHEEL , CLEAN THE PARTS TO BARE METAL . SMALL PATCHES OF ORIGINAL PAINT MAY BE LEFT ON , THEY WILL NOT COME

OFF EASILY . CLEAN THE PART AS WELL AS POSSIBLE INCLUDING PASSAGES FOR GREASE FITTINGS . FOR TIGHT AREAS , USE EMERY CLOTH OR STEEL WOOL . AEROSOL CARB OR BRAKE CLEANER CAN BE HELPFULL IN THE TIGHT AREAS . AFTER THE PART IS AS CLEAN AS POSSIBLE , TREAT IT WITH A MILD ACID SURFACE PREP , LIKE PREPOL (AVAILABLE AT AUTOMOTIVE PAINT STORES) THIS WILL ETCH THE SURFACE AND ELIMATED ANY CORROSION IN THE PORES OF THE CASTING . THE ACID ETCH WILL WORK IN ABOUT 20 MINUTES , THEN THE PART CAN BE RINSED IN WATER . WARNING ! THIS ACID ETCH IS ALSO VERY NASTY ! FOLLOW THE DIRECTIONS ADN WEAR GLOVES AND FACE PROTECTION

NOW THAT YOUR PARTS ARE NICE AND CLEAN , IT'S TIME TO DO SOME PAINTING . THE PAINT I'VE FOUND THAT WORKS THE BEST IS VHT BRAND SPRAY PAINT VHT IS AVAILABLE IN A WIDE VARIETY OF COLORS AT AUTOMOTIVE PAINT SHOPS OR SPEED SHOPS I USE GLOSS BLACK ENGINE ENAMEL FOR ENGINE AND SUSPENSION PARTS , AND THE HI-TEMP FLAT ALUMINUM FOR ALUMINUM PIECES LIKE THE THERMOSTAT HOUSING. THE PARTS MUST BE SUSPENDED FOR PAINTING SO THAT ALL SIDES CAN BE PAINTED AT ONCE . I MADE UP A NUMBER OF HANGERS FROM MILD STEEL WIRE (OLD TOMATO CAGES) AND SUSPENDED THE PARTS AT EYE LEVEL FROM THE STIFFENING ROD ON THE UNDERSIDE OF MY GARAGE DOOR . SPACE THE PARTS OUT SO YOU CAN MANUVER AROUND THEM TO GET ALL SIDES . WHEN THE PARTS ARE HUNG AND READY TO GO WASH THEM OFF WITH LACQUER THINNER APPLIED WITH A BRUSH , THIS WILL REMOVE ANY OIL THAT GOT ON THE PARTS WHILE BEING HANDLED . LET THEM AIR DRY ABOUT FIFTEEN MINUTES AND MAKE SURE THE LACQUER THINNER , AS WELL AS ANY OTHER FLAMABLES ARE CAPPED AND STORED AWAY.

NOW GET THE PAINT CANS UNCAPPED AND SHOOK UP REAL WELL AND KEEP THEM HANDY. NOW YOU HEAT THE PARTS WITH A PROPANE TORCH, BE CAREFUL ANY RESIDUAL THINNER TRAPPED IN POCKETS WITHIN THE PARTS MAY FLARE UP, SO HEAT THE PARTS SLOWLY AT FIRST, HEAT THEM EVENLY... THE AMOUNT OF HEAT REQUIRED IS A MATTER OF TRIAL AND ERROR. THE GOAL IS TO HAVE THE PAINT HOT ENOUGH SO THE PAINT SIZZLES WHEN IT HITS THE PART, BUT NOT SO HOT AS TO CAUSE THE PAINT TO BUBBLE OR BLISTER

TOO LITTLE HEAT IS BETTER THAN TOO MUCH. MAKE SURE TO SHUT DOWN AND STOW YOUR TORCH BEFORE YOU START PAINTING IN EARNEST. GIVE EACH PART A GOOD MEDIUM-HEAVY COAT OF PAINT. ALLOW 24 HOURS FOR THE PAINT TO CURE AND APPLY TWO MORE MEDIUM COATS OF PAINT, ALLOWING 24 HOURS BETWEEN THEM.

THE LAST STEP IS ABOUT THE EASIEST, BUT CAN GET A LITTLE SMELLY. THIS INVOLVES BAKING THE PAINTED PARTS IN YOUR OVEN AOF ABOUT 30 MINUTES AT 200 DEGREES. WHAT THIS DOES IS BAKE OUT ALL THE CHEMICAL PROPELLANTS AND SOLVENTS THAT REMAIN IN THE PAINT, AND REALLY SEALS IT OT THE SURFACE OF THE PART.

WHEN THE PAINT HEATS UP, IT BECOMES FAIRLY SOFT, SO I FOUND THAT THE BEST METHOD IS TO HAND THE PARTS FROM THE BAKING RACKS WITH MORE WIRE HANGERS. ARRANGE THEM CAREFULLY, SO THEY DON'T TOUCH EACHOTHER OR THE OVEN WALLS. DO NOT USE A HIGHER TEMPERATURE FOR A SHORTER TIME AS IT MAY DAMAGE ANY HEAT TREATING THE PARTS WERE GIVEN DURING MANUFACTURE. THIS PROCESS DOES PRODUCE A SMALL AMOUNT OF FUMES, SO USE YOUR HOOD VENT OR OPEN SOME WINDOWS. WHEN HEATING IS DONE ALLOW THE PARTS TO COOL IN PLACE.

THE RESULT IS A VERY HARD LOW-GLOSS FINISH THAT IS AS TOUGH AS THE ORIGINAL AND SHOULD LAST MANY YEARS.

THIS IS A LOT OF WORK. VUT THE RESULTS ARE WORTH IT, AND YOU GET THAT DO-IT-YOURSELF SATISFACTION

REMEMBER, TAKE YOUR TIME AND BE CAREFUL!

KURT OBLINGER - VOLUME 91, DECEMBER 1990

BITS AND PIECES

IT IS UAUALLY A GOOD IDEA , EVERY SO OFTEN , TO DO A COLUMN ON THE SHORT ITEMS YOU HAVE THAT ARE TOO SHORT FOR THEIR OWN COLUMN !

1) SOME OF YOU MIGHT RECALL THE SCIENTIFIC PUBLICATIONS SHOP MANUAL FOR THE TR2 THRU TR4 MODELS THAT CAME ON THE SCENE IN THE '60'S . IT WAS PRINTED BY SCIENTIFIC PUBLICATIONS IN SYDNEY AUSTRALIA , AND WAS A VERY GOOD AND COMPLETE SHOP MANUAL FOR A GOOD PRICE . ABOUT TWO YEARS AGO WE GOT A SUPPLY OF THIS MANUAL , WHICH IS OUT OF PRINT , THROUGH THE COOPERATION OF ALAN MITCHELL OF THE TR REGISTER AUSTRALIA . NOW ALAN TELLS ME HE HAS FOUND 20 MORE OF THEM AND THEY ARE ON THEIR WAY TO US COMPLIMENTS OF MAL MUNRO , ALSO OF THE TR REGISTER AUSTRALIA . WE DON'T KNOW THE PRICE YET , BUT IT SHOULD BE VERY GOOD.

2) WHEN YOU LUBE YOUR FRONT WHEEL BEARINGS , PARTICULARY ON DISC BRAKED CARS , BE SURE TO USE WHEEL BEARING GREASE THAT IS INTENDED FOR USE WITH DISC BRAKES. THE DIAC BRAKES GENERATES MORE HEAT THAN THE DRUM BRAKES , AND THE MELTING POINT OF THIS GREASE IS HIGHER . WE HAVE SEEN SEVERAL FAILURES LATELY , THAT HAVE BEEN CAUSED BY THE USE OF THE WRONG TYPE OF GREASE.

3) OVER THE YEARS , I HAVE USED MANY MAKES AND TYPES OF GASKET ADHESIVES , WITH SUCCESS RATES VARYING FROM ZERO TO WORTHLESS , TO VERY GOOD INDEED RECENTLY I HAD A TR ENGINE THAT WE COULD NOT KEEP THE HEAD GASKET IN , AND EVEN THOUGH THE GASKET SURFACES WERE PERFECT IT HAD A TENDENCY TO LEAK COMPRESSION INTO THE WATER JACKET . WHILE TALKING TO PETER RAFAEL OF GLENNIS RACING HE TOLD ME THAT THEY HAD BEEN USING "YAMABOND" , A SPECIAL ADHESIVE THAT WAS CREATED FRO AND SOLD BY YAMAHA MOTORCYCLE DEALERS . THIS ADHESIVE HAS PROVEN ALMOST FOOLPROOF , BUT IS A BIT DIFFICULT TO APPLY . WE FIND NEW USES FOR IT ALL THE TIME.

KEN GILLANDERS - VOLUME 71 , FEBRUARY 1989

NEOPRENE VALVE COVER GASKETS

THE FLE-PRO COMPANY HAS BEEN SELLING NEOPRENE VALVE COVER GASKETS FOR AT LEAST 15 YEARS AND BRITISH FRAME & ENGINE HAS BEEN HANDLING THEM SINCE IT'S INCEPTION . MANY HAVE BEEN SOLD AND WE HAVE HAD A FEW COMPLAINTS DIRECTED TOWARD THE PRODUCT . MOST COMPLAINTS ARE NOT THE PRODUCT'S FAULT BUT LACK OF UNDERSTANDING BY THE INSTALLER.

FOR THE BEST RESULT , THE VALVE COVER SHOULD BE CLEANED THOROUGHLY WHERE THE GASKET IS ATTACHED . THE GASKET SHOULD BE GLUED PERMANENTLY TO THE COVER BY USE OF A GOOD PERMINATE ADHESIVE (3M TRIM CEMENT , YAMABOND, ETC.) . DO NOT PUT ANY CEMENT , SEALENT , GREASE , OR ANYTHING ELSE ON THE SIDE FACING THE HEAD IT MUST BE CLEAN AND DRY !

PREPARED AS ABOVE , THEY WILL PRECLUDE THE MOST COMMON PROBLEM , THAT IS THE GASKET SQUEZING OUT FROM UNDER THE COVER . ALSO , YOU CAN USE THE GASKET OVER AND OVER WITHOUT CHANGING IT . IN ADDITION , YOU WILL PRODUCE AN OIL SECURE JOINT FOR MANY YEARS . IF YOU HAVE ONE OF THE ABOVE GASKETS , DON'T GIVE UP , TRY TO FIT IT AS OUTLINED AND I THINK YOU WILL BE IMPRESSED BY THE RESULTS.

KEN GILLANDERS - VOLUME 77 , AUGUST 1989

SEAT BELTS FOR OLDER TRIUMPHS (AND OTHER CARS)

THESE DAYS MOST OF US ARE USED TO THE THREE-POINT LAP AND SHOULDER BLETS FOUND IN NEWER CARS INDEED , THEIR USE IS NOW REQUIRED BY LAW , AS ARE CHILD SAFETY SEATS . SINCE WE ARE SO USED TO THEM IT FEELS UNCOMFORTABLE TO DRIVE AN OLDER CAR NOT EQUIPED WITH SEATBELTS . I HAVE BEEN ASKED TO TALK ABOUT INSTALLING SEATBELTS IN OUR CARS , AND I'LL INCLUDE SOME OTHER SAFETY RELATED TO GO ALONG WITH IT .

FIRST OFF , WHILE WE DO HAVE A MANDATORY SEATBELT LAW HERE IN CALIFORNIA , IT DOES NOT APPLY TO CARS THAT DID NOT COME WITH THEM FROM THE FACTORY OR DEALER . AMERICAN CARS STARTED LISTING SEATBELTS AS OPTIONS IN THE MID-FIFTIES , AND WERE PRETTY COMMON BY THE EARLY '60'S . TRIUMPHS DID NOT START SHOWING UP WITH THEM UNTIL THE MID-SIXTIES (I BELIEVE IN '66 THEY WERE REQUIRED IN CALIFORNIA . ALTHOUGH DEALERS MAY HAVE INSTALLED THEN EARLER) . THEREFORE , IT IS NOT REQUIRED FOR THE TR2/3 SERIES CARS TO HAVE SEATBELTS UNDER CURRENT LAW . HOWEVER , IF YOU ARE CARRYING SMALL CHILDREN IN THE CAR (UNDER 40 LBS) THEY MUST BE BELTED IN AN APPROVED SAFETY SEAT . THIS IS A REAL GOOD LAW ! FOLLOW THE SEAT MANUFACTURERS DIRECTIONS FOR INSTALLATION . THE CHILD RESTRANT LAWS APPLY TO ANY AGE VEHICLE.

IF YOU WOULD LIKE TO ADD BELTS TO YOUR EARLY CAR (THAT DID NOT COME WITH THEM), IT IS EASY ENOUGH TO DO . LETS TALK ABOUT THE DIFFERENT KINDS AVAILABLE AND HOW THEY WORK LAP BELTS ARE THE MOST COMMON AND FAMILIAR . THEIR BASIC DESIGN HAS NOT CHANGED FOR 30 YEARS . AFTERMARKET BELTS ARE AVAILABLE AT ALL AUTO PARTS STORES . THE MOST COMMONLY AVIALABLE ARE MADE BY SUPERIOR AND RETAIL FOR ABOUT $16 PER SET (ONE SEAT) . THEY ARE AVAILABEL IN COLORS (RED , BLUE , BROWN , AND BLACK) AND INCLUDE MOUNTING HARDWARE . THE BUCKLE STYLING IS MOST APPROPRIATE FOR A CAR OF THE SEVENTIES BEING MOSTLY PLASTIC . ORGINAIL (FIFTIES) STYLE BELTS ARE AVAILABLE THROUGH J.C. WHITNEY , FOR EXAMPLE , AND HAVE CROMED METAL BUCKLES . THESE BLETS SHOULD BE INSTALLED ACCORDING TO MANUFACTURERS INSTRUCTIONS AND WILL SERVE THE NEEDS OF MOST OF YOU.

YOU SHOULD BE CAUTIOUS WITH AFTERMARKET SEATBELTS , THERE ARE MANY INHERENT DANGERS IN THEIR DESIGN AND INSTALLATION . FIRSTLY , BOLTING THEM TO THE FLOOR WILL NOT TAKE THE WEIGHT OF YOUR BODY IN A SERIOUS COLLISION . MOST TRIUMPH

FLOORS ANR THIN AND RUSTY AND THE SHEET METAL WILL SIMPLY PUNCH THROUGH WITH THE WEIGHT OF YOUR BODY ACCELERATED BY THE IMPACT . THEY MIGHT MAKE YOU FEEL SAFER THAN YOUR REALLY ARE ! A REAR IMPACT , SUCH AS BEING STOPED AT A LIGHT , IS A PERFECT EXAMPLE FOR THE DESIRABILITY OF A BELT AND THE POTENTIAL FAILURE OF THAT BELT IF NOT PROPPERLY INSTALLED . THE BELT MOUNTING POINTS MUST BE TO THE FRAME IN ORDER TO BE SAFE . CARS DESIGNED FOR BELTS HAVE SPECIALLY REINFORCED AREAS TO ATTACH THE BETS . IF YOUR CAR CAME WITH BELTS (TR4 ON ,FOR EXAMPLE) AND THEY HAVE BEEN REMOVED , REATTACH THE NEW ONES TO THE SAME POINTS IF YOUR CAR IS , SAY , 20 YEARS OLD AND STILL HAS THE ORIGINAL BELTS , I SUGGEST YOU REPLACE THEM (THE MATERIAL ROTS , JUST LIKE THE REST OF THE INTERIOR AND IS A PARTICULAR PROBLEM IN OPEN CARS) . A GOOD WAY TO ATTACH BELTS IS TO AN EYE BOLT BOLTED THROUGH A FRAME MEMBER . THIS IS EVEN MORE IMPORTANT TO THOSE OF US WITH WOODEN FLOORS (1800 , 2000 , MORGAN , ETC.).

OTHER TYPES OF SEATBELTS INCLUDE THE THREE-POINT BELT WHICH HAS BEEN STANDARD ON CARS SINCE THE SEVENTIES (LATER TR6'S , SPITFIRES , STAGS , ETC) THESE CAN BE ADDED TO THE EARLY CARS BY ATTACHING THE SHOULDER STRAP TO THE DOOR POST , BE CAUTIOUS BOLTING THE SHOULDER STRAP TO THE FENDER WELL , FOR THE SAME REASON AS THE FLOOR . THIS IS ESPECIALLY USED ON THE DRIVERS SIDE WHERE THAT BIG STEERING WHEEL IS AIMED AT YOUR FACE . THIS IS THE SAFEEST COMBINATION FOR EVERYDAY DRIVING .

WHILE THIS ARTICLE IS AIMED PRIMARIALLY AT THE EVERYDAY CAR , A MENTION SHOULD BE MADE OF RACING BELTS . GENERALLY , RACING BELTS ARE MUCH WIDER AND MADE OF STRONGER MATERIALS . THEY ARE AWKWARD FOR EVERYDAY USE BECAUSE OF THEIR BUCKLES AND ATTACHING HARDWARE ARE MUCH LARGER . THESE CAN BE BOUGHT AS LAP 'ONLY', LAP AND SHOULDER , AND FIVE POINT BELTS WITH AN ANTI-DIVE STRAP ATTACHED , UH , BETWEEN THE LEGS . A FEW OF OUR CLUB CARS ARE EQUIPED WITH RACING BELTS , AS WAS MY TR3 WHICH I USED FOR RACING . THEY ARE AVAILABLE FROM LOCAL SPEED SHOPS PR DIRECT FROM THE MANUFACTURER . FILLER SAFETY IN SAN FERNANDO OR SIMPSOM IN BURBANK , TO NAME TWO . IF YOU DRIVE YOUR CAR HARD ENOUGH TO CONSIDER RACING BELTS YOU SHOULD CONSIDER A ROLL BAR AS PART OF THE PACKAGE . I HAVE SEEN TR3'S ROLL OVER AND WHILE ROLLOVERS ARE VERY RARE IN NORMAL DRIVING , THEY HAPPEN . TR'S AND SPITFIRES PROVIDE ALMOST NO ROLLOVER PROTECTION AND IF YOU ARE FIRMLY STRAPPED IN AN UPRIGHT POSITION , IT WILL BE TRAGIC.

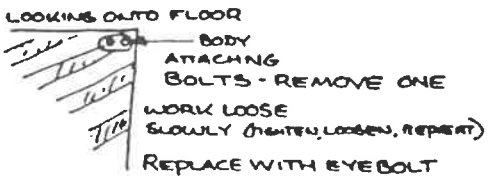
MY RECOMMENDATION FOR THE AVERAGE DRIVER LOOKING FOR SOME ADDITIONAL PROTECTION WOULD BE A SIMPLE LAP AND SHOULDER BELT FOR THE DRIVER AND A LAP BELT TO THE PASSENGER . ALSO A LAP BELT FOR THE REAR SEAT IF YOU ARE CARRING CHILDREN . ATTACH THE BELTS SECURELY TO THE FRAME OR OTHER REINFORCED PLACES DO NOT RELY ON THE LARGE WASHER AS SUPPLIED WITH THE KIT . FOR THOSE OF YOU WITH RESTORED CARS , FIFTIES STYLE BELTS ARE AVAILABLE . THE BEST PREVENTION OF ALL IS TO AVOID THE ACCIDENT IN THE FIRST PLACE -- LET'S BE CAREFUL OUT THERE !

STEVE HEDKE - VOLUME 84 , APRIL 1990

FIG. 1
LAP BELTS

FIG. 2

FIG. 3



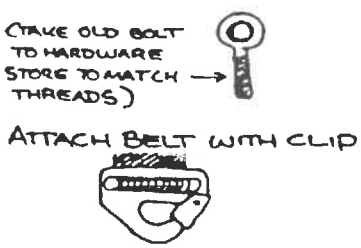


FIG. 4 3-POINT LAP+SHOULDER BELTS

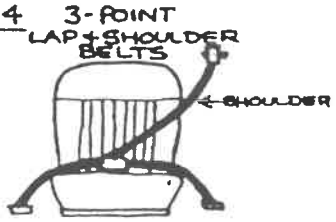


FIG. 5
5-POINT HARNESS (USE WITH ROLL BAR)

CHOKE CABLE REPAIR

If your choke cable is like the last three that I have had, they are frayed at the end, bent, and always-too short! I have just fixed mine for only $1.00 and 20 minutes of work. (Simple work at that).

N.O.S.(new old stock) choke cables are almost non-existent and the reproduction choke cables on the market can't be used with the original knob. The after market cables also cost more than five dollars.

If your interested, here's what to do:

I) Purchase inner 10 speed bicycle, derailleur cable. I bought JTB #1100, 77" cable for $1.00 at the weekly flea market-swap meet. This is the exact size as the original.

II) Use a 100 watt solder gun/iron and heat the end of the brass shaft where the old cable attaches.

III) After about 10 minutes of heating, the old cable can be pulled out of the brass shaft.The cable goes into the shaft about one half inch.

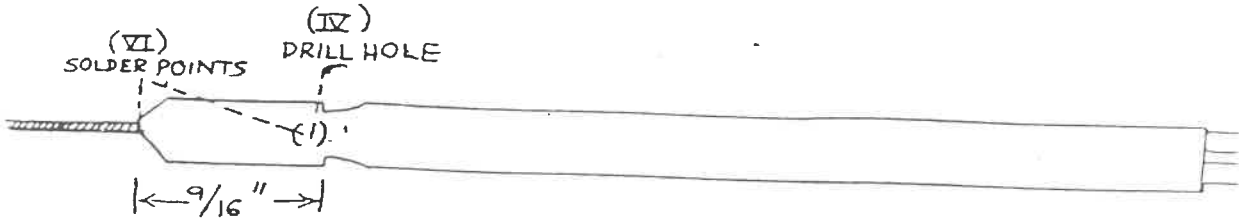
IV) One half inch from the end of the shaft,is an indentation. Use a small drill bit, 3/32 or smaller, and drill a hole, through the indentation, through the brass shaft.

V) Place the new "derailleur" cable into the brass shaft, just past the hole that you drilled.

VI) Using Silver Solder,(this is the strongest and a must to use) solder the cable in place- first, at both ends of the hole you drilled, and then at the tip of the shaft where the cable enters.

VII) File off any excess solder. Install cable and snip off to size.

This small operation makes that old worn out, tired choke cable into a new cable just as strong if not stronger than the original.



REAR HUB LEAKS

One of the most persistent problems with the TR-2 and early TR-3 is oil leakage from the hub splines on the rear axle. This problem on the early cars (cured on the later cars with the "Girling" rear axle) is that no provision was made to seal the splined outer end of the axle shaft to the hub. Gear oil would work its way out between the outer splines and the hub, and become deposited on the outside of the rear wheels. Over the years, we have tried Mastic, Permatex, 3M weatherstri cement, with no success.

Now, however, we have found that if the splines on the outer end of the axle shaft and inside the hub are cleaned in laquer thinner, and all traces of old adhesives are removed from the outer collar and flat washer, it is possible to effec an excellent seal by coating both sets of splines with a thin layer of G.E. Silicone. After assembling the hub on the axle shaft, fill the cavity where the outer collar fits with more silicone sealant, then press home the collar. After wiping off the excess and allowing the sealant to cure, you will have an effective and elastic seal that should bring an end to the mess on your rear wheels.

Ken Gillanders
Newsletter #22

MISC. KNOCKS & NOISES

Adding to the list of annoying noises made by elderly TR's are those most common; engine noises. Here are a few things t check for.

1) Fan hub rubber bushings. This annoying noise is most notic able at idle, and usually subsides when under way. This clatte ing sound is usually diagnosed (incorrectly) as a bad timing chain tensioner or a very loose timing chain. You can diagnos it yourself by gripping the fan and trying to wiggle it, check- ing for looseness. If it's loose, you'll have to pull the fro apron off to change 'em. This, of course, is the time to con- sider changing to a Hayden Flex-fan, a great improvement.

2) Timing chain tensioner. It may sound like a worn tensione because that's in fact what it IS! Again, the apron will have to come off, then you can remove the lower pulley and then the timing cover to replace the tensioner (and the chain, if at al suspect).

3) Lower pulley and hub assembly. While you're at it, check that unit as you go to remount it on the crankshaft. The slot for the Woodruff key may be worn, allowing the hub to bang bac and forth on the crankshaft. Loctite "Quick Metal" is the ans- wer to that one.

4) Lower end wear. This is probably the most common engine noise...it's very easy to diagnose, but not easy (or cheap) to repair. It usually manifests itself as a dull knocking sound when the engine is first started up after sitting over- night, and disappears as the oil pressure comes up. This gen- erally indicates worn rod bearings. Replacing the worn bear- ings will help, but it is often only a temporary solution, as the crankshaft will likely be out of round, and needing a re-g

Ken Gillanders
Newsletter #22

CLUTCH SALVE CYLINDER RETURN SPRING

First, a common misunderstanding is over the clutch slave cylinder return spring. I have seen about every possible spring substituted for the factory spring. However, the factory spring is designed with the correct tension load and tension gain to over come the natural resistance of returning the clutch release bearing beyond the reach of the clutch plate fingers and is additionally designed to return the hydraulic system to a position of rest. DO NOT SUBSTITUTE for the factory spring. It can be recognized by the design of one end, which is square rather than a smooth open hook.

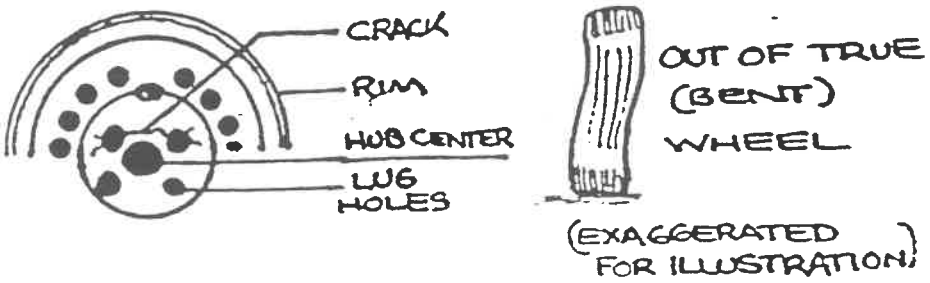
Ken Gillanders
Newsletter #1

WHEEL PROBLEMS

Recently, Kathe Leber came by, complaining of vibration in a front wheel. The wheel bearing had been recently replaced, and the tire appeared round (steel-belted radials do go out-of-round). After pulling the nave plate (hub cap) and spinning the wheel while still mounted, we discovered that the wheel was not running true. Take a long screwdriver and anchor it to the ground, spin the wheel, then edge the top of the screwdriver closer to the wheel until it begins to touch. If it only touches intermittently, the wheel or tire is out of "true".

In this case, the wheel center had a nasty crack developing! (see illustration) It was clearly visible, and about four inches long. Ken Gillanders has warned us that in high-performance applications, these wheels have been known to fail, often with terrible results. Now it would appear that these disc wheels are of sufficient age that metal fatigue could be a serious problem. I would advise all of you with disc wheels to periodically check the wheel centers for signs of cracks.

Steve Hedke
Newsletter #23



SPEEDOS & TACHS

It seems that the older we get, the more our thinking gets locked into one track. Recently I had an experience which tended to throw the switch on my one-track mind.

A group of my friends had gathered in my garage for an informal session of bench racing, beer drinking, etc., when the subject got around to the relative accuracy of mechanical tachometers and speedometers compared to electronic ones. I offered that the mechanical system on the Triumph was accurate, and remained so throughout its lifetime. That proclamation brought about a great deal of argument that mechanical tachs and speedos should be calibrated from time to time, as wear, fatigue, and extended use tend to throw them off, usually so that they read high.

After much discussion, it was agreed that an electronic Sun tachometer would be used to compare the relative accuracy of the tach in the TR-2. To get a common base line, the Sun was checked against the tach in the Corvette and against a recently rebuilt one in an Austin-Healey 3000. When we finished, lo and behold, the tach in the TR was 300 RPM high at idle and 500 RPM high at 3000 RPM.

After having the tach calibrated, I noticed a rather remarkable difference between the tach and speedometer when I was under way, particularly in fourth gear, where the tach reading is supposed to be directly related to the speedo reading (half of it-ed.). Out came the speedometer, and it was found to be reading 8 mph high at an indicated 70 mph. The people at the speedometer shop (MO-MA in North Hollywood) stated that my problems were almost the usual of long use and no recalibration, and that any car over twenty years old can expect it. (A number of our club members have had MO-MA rebuild instruments, and if what I have seen is representative of their quality, they must be very good indeed.)

Unfortunately, a high-reading tach creates a fallout problem in that the owner seemingly can't get the engine to idle smoothly below an indicated 1000 RPM, while it is actually idling between 600/700 RPM, far too slow for proper cylinder wall lubrication. It might pay to check these instruments out.

Ken Gillanders
Newsletter #24

TODAY'S TOPIC - SIDECURTAINS

As a follow-up to Tim Matthews' enlightening repro. vs. restored original side curtains article in the last Triumph Tribune, we will have a look at just what original side curtains consisted of, and some of the differences between them.

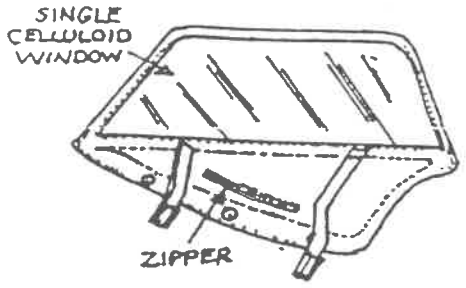
When the TR-2 started production at the end of 1953, the side curtains used a single solid window made of celluloid (like isinglass). These curtains had a zipper in the cloth flap below the window to give hand signals and to get in the car when the top and curtains were in place. (Remember, no outside door handles!) Another quirk of these early curtains is that there were only three lift-a-dot fasteners on the lower edge of the cloth flap.

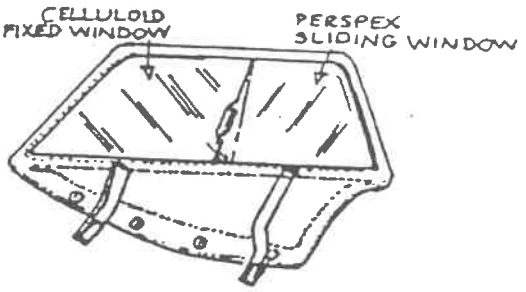
Later, when the hardtop was made optional on the TR-2, the curtains were modified to include a sliding panel of Perspex(plexiglass to us Americans) for the rear half of the window. There were now four lift-a-dots on the bottom and the zipper was done away with. The curtains continued in this basic form for the rest of the TR-3/3A/3B series except for one big change, which was in the mounting system.

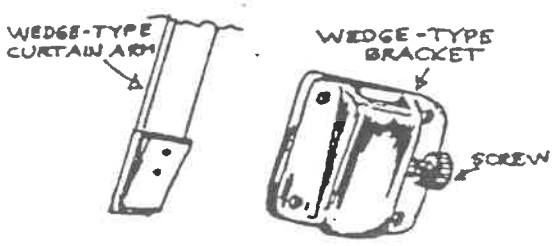
The first mounting system was the wedge type, which featured a squarish "stake pocket" bracket on the door. The curtain arms had a wedge-shaped piece stuck on the tips which was inserted in the brackets and could then be tightened down with the adjustment screw on the side of each bracket. This system was used on the TR-2, TR-3, and TR-3A up to Comm. No. TS28825. Beginning with TS28826, a new mounting arrangement was used, and this was known as the Dzus type(or 'button' type as some parts places call them). This set-up had shallow brackets with a large hole in the center. The curtain arm rested against this bracket and was secured by a Dzus fastener. (similar but not identical to those used to fasten the hood down) This arrangement was used for the remainder of the 3A/3B series.

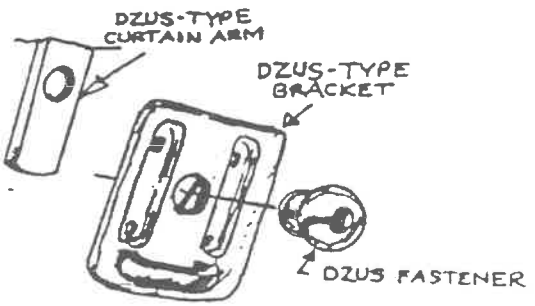
If you are buying reproduction curtains,(they are available in both types) it is vital to get the correct ones, as they are not interchangeable.

Martin Lodawer
Newsletter #4









MISC. ANNOYANCES

As our TR's become more elderly and more used, they can start developing some strange and disturbing noises and non-desireable behavior. Here, we'll try to describe a few symptoms that we have seen over the years, and the answers that we found to them. The list is by no means complete and the answers may not always solve your particular problem, but it is a place to start.

A high-pitched squeak that appears to come from the right rear corner of the car and seems worst on uneven pavement or when going around corners can usually be traced to the fuel tank overflow pipe rubbing against the lower spring plate or even the frame itself. The cure is simply to bend it slightly out of the way and to be careful of it in the future when you raise up the car with a floor jack.

A squeak in the front end when going through dips in the pavement that cause a good amount of suspension travel can generally be traced to the front shock absorbers. The seal in the damper used on the early cars would dry out and then squeak. The only solution I have found is to replace the shock absorber. (Editor's note: another common cause of front end squeaking, especially at low speeds on rough surfaces, are the nylon lower A-arm bushings fitted to these cars (except the TR-2 and very first TR-3's). These must be oiled regularly or they'll squeak like hell.)

A rumble or squeal that begins when you step on the clutch pedal and goes away when you take your foot off is generally a bad clutch release (throwout) bearing. The origin of this problem is usually NOT in the bearing itself, but in the use of wrong linkage and/or return springs in the clutch unit, which results in premature failure of the bearing. There is one, REPEAT, ONE correct return spring and linkage to be used in the TR-2/3/3A/3B series vehicle, and anything else (door springs, pieces from hardware stores, later linkage parts, etc.) will bring your release bearing to grief. The correct parts are available from the Roadster Factory, and probably the other major parts places such as Moss Motors, Start Your Engines, and Sports & Classics.

Ken Gillanders
Newsletter #17

THE RESURRECTION of TS11308LO

by Steve Hedke

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THE RESTORATION OF TS 11308LO - by Steve Hedke

NOTE: This will be a regular series of articles on the restorati of our car. It will serve as my personal log of the project, but may be of help to those of you considering the same sort of proje on your own car. I hope it will be of interest to you.

I will begin this series by describing the car in question (I assure you that its heritage as a car WAS in question!). TS113 was built in Coventry, England on Monday, May 28, 1956 between 1 2:00 PM. Its original color was beige, with brown leather uphols and it was equipped with the optional wire wheels and overdrive. This information was supplied by the Standard Register in England for a small fee, and you can contact Marty if you would like the build record for your car.

The car came here from Indiana in 1966, somehow ended up in repossession yard in Sun Valley, and sat there until I was told a it two years ago by a friend who is into Corvairs. The car was v sad. It was complete, from its early front bumper and overriders its side curtains, but completely dead. We literally dug it out its parking spot after hacking out dense underbrush. Somehow, th ancient tires managed to hold air, ans she reluctantly rolled ont the trailer. The price for a complete, but rancid TR-3 was $450. and they were glad to be rid of it.

Next stop was the DMV, and not without some fear. As it was intention to restore the grubbiest TR I could find (see Prez Sez) was worried that I could not get a pink slip, as all traces of pr vious papers had long since been lost. To my great relief, a new set of laws allowed me to title the car after a computer check an verification of the serial number. The DMV inspector was looking the grubby builders' plate and said: "This serial number is incor rect; there is an additional "0" at the end." !!! I immediately dove under the trailer to look and there it was... it was still i place! (the overdrive, in case you haven't guessed - ed.) I now have my pink slip, but the car cannot be registered until it can pass the smog inspection, which is difficult when your engine if frozen up more solidly than the south pole.

The next step was an initial cleaning. The interior was ca fully emptied, as it was full to the top with garbage. Careful sorting uncovered two original jacks and one handle for same, bo side curtains (one of which was good enough to use), the bumper overriders, heater parts, and so on. After hitting bottom, we d covered that there was no bottom; the floor and seats had rusted through. A trip to the local quarter car wash sent several poun of mud and rust (and many spiders) away from my treasure. This nowhere near enough, but it was the best that could be done whil the car was still in one piece.

The car then sat for a couple of years while we moved into house, changed jobs, and generally did a bunch of unimportant do estic stuff. During this time the Ten was finished up, having b completed just this year. Selling it provided enough funds to b the restoration, but the decision as to how much work to do was long and hard one. The engine was very frozen and required a co plete rebuild. All the suspension bushings were shot, and every thing was still coated in three inches of mixed grease and mud.

It would have been possible to rebuild the car one step at a time, and therefore be able to drive it much sooner. However, to make a proper job of it, the body would have to come off.

This was much easier than I first thought it would be. Firs the front apron and fenders were removed. Then, the engine and t were pulled as a unit. A dolly was built to set the body on. Th steering column, wiring, and attaching bolts were removed, then f of us easily lifted the body off and set it on the dolly. This t about two days.

Now for the real work. The rear springs and axle were remov leaving the bare chassis sitting on jack stands. The frame was t scraped (more tons of mud and grease), buffed with a wire wheel t remove surface rust, then primered in red oxide. The frame was o inally painted the same color as the car, so I took the plate tha covers the access hole to the master brake cylinder off the firew (the original color on it was in good shape, and it was easily ca ried), and took it to the local automotive paint store. The orig color is of course, no longer listed, so I searched the chip book find the closest match. Eventually I found a Mercedes that was v close, if just a shade lighter. A gallon of DuPont Centari acryl enamel, with reducer and hardener was $63.00. The frame was spra with an airless sprayer at home. Airless sprayers are fine for frames, underbodies, and interiors, but they do not have the fine control necessary for a smooth exterior finish.

With the frame painted, reassembly can start. Currently, th front suspension parts are being stripped, painted, and reassembl with new bushings where necessary. Engine and trans parts are ei on order or are already here. Import Motor Parts in Van Nuys sup almost every part I needed, from crankshaft bearings to an origin Lucas battery.(glutton for punishment - ed.) We get a nice disco from them, they are knowledgeable, and amazingly fast! I had thr pages of parts on order, including rebuilding the starter and gen ator, and they had them waiting for me on the next day! Dealer i (specifically pilot bushings, synchro rings, etc.) were ordered f the Roadster Factory by phone. They are fast, courteous, and hav number of parts not normally available. Parts for the engine hav cost around $800.00 so far. This includes a new used crankshaft $100.00, reground cam (stock) at $60.00, new valves, guides, and seats at about $200.00 (including labor, glass beading the head, surfacing). Engine, trans, and overdrive will be installed as a unit.

That gets you caught up on the project to date. The next re will cover engine, trans, and suspension assembly. I hope some o this information is of use to you, and I promise not to be so lon winded in future reports.

Steve Hedke
Newsletter #15

Part 3 - Engine and Transmission Assembly

The last installment of this saga dealt with the acquisition and preparation of the engine parts. Since engine assembly is the same as in most shop manuals, I will avoid a blow-by-blow description and stick to things that you won't find in the book.

Crankshaft, pistons, liners: Thoroughly oil the pistons and rings before assembly. Make sure all surfaces are clean, including the backs of the bearing shells and their mating surfaces. Use a wooden block to tap in the liners, and make sure the figure-eight gasket surface is clean. Every liner set I have seen so far has had the liner gaskets twisted during shipping - do not attempt to use it like that! Clean new liners (or hone out old ones), then thoroughly oil them. This is especially important when you don't expect to use your engine for a while. Any good 30-weight will do. I use clean white grease for assembly lube (rod and main bearings), but if you are real fussy, you can use something like Isky Rev-Lube. Do not use white grease on camshafts; you must use a good lube designed for cams unless you like flattened lobes and dished lifters!

Cam, distributor, oil pump, pan, etc.: Cam timing on TR's is very critical to how they run, not if they run. A cam can be 10° retarded and still run. I can't take the time to describe the whole procedure (check TRSC newsletter #14), but I can tell you this: DON'T FOLLOW THE SHOP MANUAL!! I did, and my cam was 6° retarded. Always change your timing chain tensioner. Tighten the bolts on the timing cover and oil pan carefully; do not over-tighten to try and cure pesky leaks. Over-tightening can and will break old bolts, as well as dish out the hole around the bolt. Before assembling, dolly the holes flat with a hammer and a suitable block of wood. A truly straight pan should not leak. To avoid possible engine damage when first starting, you can prime the oil pump. Fill the oil passages of the pump (carefully) before installing unit to the engine. Fill the oil filter assembly as much as you can and install. Then, once the pan is on (as well as the head and valve train), fill the engine with oil. Now, modify an old blade-type screwdriver to fit the key-way for the oil pump, chuck it into an electric drill, set it to turn in the direction of rotation (anti-clockwise), and run it. Soon, oil pressure will build up. Watch for oil around the oil pressure guage fitting (hook it up if you want) and the rocker arm pedestal. When you have oil here, starting the engine the first time will not be quite so risky. Now you can put in the distributor. Be sure to check the vacuum advance for leaks (suck on it), and make sure the advance springs are reasonably tight. Also check for up and down float, as well as side to side.* Any slop here will alter timing while you drive. Set the ignition timing as described in newsletter #6.

*the distributor shaft

Continued

The rest of the engine assembly is straightforward and done as the book says.

The transmission is not so simple. There are no sharp tricks or shortcuts here. I wanted my trans to be very quiet, so I ordered all new bearings and gaskets for it (Import Motor Parts keeps them in stock). What I didn't know was that my 1st gear countershaft had a tooth busted off. This is a very common problem. Only non-synchro trans parts will work. Don't try to use TR-3B or TR-4 parts unless you want to change transmissions. Since I'm doing a restoration to original, I replaced the counter gear. Stick with the book and you should be OK. This is not a job for the weak-hearted, however. It's tricky. Use only small hammers!

The overdrive presented an additional problem. There are eight clutch return springs that must be fitted when mating the overdrive to the trans. This is best accomplished (after trying a bunch of ideas including six hands) by following the factory method and sticking the O.D. in a vise, then putting the trans down on top of it. It's awkward as hell, but it works the easiest.

Once the engine and trans were assembled, they were put into the chassis. All the various engine bits were installed including the radiator. Straightening all those stupid cooling fins just about drove me crazy, but the radiator sure looks good! Hoses, belt, and a 50/50 mix of coolant and water were next, but I had two problems. The lower hose metal connecting pipe leaked, and the thermostat housing did likewise. The lower hose pipe was too far gone to fix (acommon problem), so I replaced it with a chrome bathroom sink drain pipe. Works perfectly, looks good, and it's cheap. The thermostat housing would not cooperate, no matter how many gaskets and how much Permatex I used. Finally, I used silicon sealant, and this worked perfectly. Just clean both surfaces, put a small bead around the area to be sealed, let it "skin", then bolt on without a gasket.

Finally, the time came for the big test....would it run? I cranked her over a few times to rebuild the oil pressure, pumped up the fuel, put spark to the coil, hit the starter, and BRUMMMM! She fired on the first hit! The starter didn't even make a full revolution, and she was idling perfectly! I still can't believe it, but Marty Lodawer was right there to witness the whole thing. Never before have I put together an engine that was so right from the very beginning. Now for the first time in fifteen years, TS 11683E was making noise again (I left the mufflers off so the whole world would know!).

After all this time, I finally had something to show for all of my work and money. After correcting a few minor problems, I started attacking the suspension, spurred on by this major success. The next article will cover the suspension and the differential.

Steve Hedke
Newsletter #17

Rain?!! What in the heck is it raining for in September?!! It probably hasn't rained for 56 years around here in September! Just when I'm right in the middle of my bodywork!!! Oh, well: just on of the unexpected joys of restoring an old car.

I'd like to start with a caution about the overdrive unit: be VERY CAREFUL of the roller for the pump assembly when installing the unit onto the trans. The roller must be on top of the cam, or it will break and the O.D. will not work. Make a simple tool from a clothes hanger to act as a hook. It will be obvious when you look at the unit as to how it works. (Thanks to Ken Gillanders for this tip.)

Front suspension was next. A rebuild kit was ordered from Roadster Factory including new Silent Bloc's. You will need some sort of spring compressor of the sort shown in the factory shop manual. You cannot use hydraulic jacks with the body off, and a proper compressor makes the job SO much easier. I didn't have access to one when doing mine, and rented a similar tool from a local rental yard. (I have since used a tool that Joe Shepherd built on another car, and you just can't imagine how easy it made the whole job!) Cleaning and painting the parts is straightforward if messy, as years of accumulated mud and grease had formed a sedimentary rock formation that only vaguely resembled a suspension. As the car is a basically low-mileage beastie, the upper ball joints, tie-rod ends, and one trunnion were in good shape (including the gaiters). The other trunnion was apparently bent, as it would only turn so far. Removing the stop-bolt should allow you to unscrew the trunnion all the way off.

A note about trunnions: the TR3 has several all around the car. The Idler arm is also a trunnion, as is the handbrake equalizer. If your trunnions are ju a little sloppy, it is possible IN SOME CASES to tighten them one turn, and elim excessive sloppiness. It may also be possible to hard-chrome the screw portion to eliminate the slop. At any rate, Roadster Factory has some beautiful replace and that's what I used. Tight trunnions will go a long way to solving skitteris front ends.

If you got it apart, you can surely get it back together. Make sure you use white grease on all the bushings (including rubber) if the car is going to sit for a while after assembly. Old bushings may need to be pressed out, but if you're careful, you can hacksaw through the old brass bushings, cutting just to the suspension arm. That will relieve the tension, and make it much easier to remove. Grease up the nylon bushings, too, to prevent corrosion on the rubbing surfaces while waiting for use. During use, motor oil should be used in these areas, as the service manual suggests. Make sure the Zirc fittings are cleaned of hard grease, and that they work properly before instellation.

A few more pointers on the front end. Make sure you put Nyloc bolts back where they came from (new ones are available), and that all cotter pins are in plac Special tools will be needed for disassembly and assembly: pickle fork, spring compressor, press (for bushings and Silent Bloc's - or you can take the parts to any good machine shop, and pay a modest fee to have the presswork done. Don't try a big hammer and a socket.), and a bench vice to hold the parts for cleaning. Rubber gaiters must be in good shape or those parts will wear out in a quick hurry.

The rear suspension is easy. New shackle bushings are available from Roadster Factory, and just slip in (it's easy, do it even if you don't think you need it). The front ones are press fit, and it will take at least a five-ton press to remove them. They are similar in design to a Silent Bloc. Leaf springs shouldn't be a problem, but if you suspect they are bad, rebuilt assemblies are around. As a caution, make sure you put them back on the same side they came from. Use white grease liberally (it can't hurt).

Differential repair is simple and straightforward. Naturally, I am using the original Lockheed rear axle (most of you will have had that replaced with the later type by now). Almost everyone who has used an early axle swears that they will break at the splines if you even look at them cross-eyed. I have to believe that's true, so I bought new axle shafts and spyders, even though mine looked good. (If nothing else, this gives me two spares). Don't expect these parts to be easy to find. Lockheed axle assembly is easier than the later one (fitted from TS 13046), and the bearings are standard off the shelf items. As I recall, the axle shaft bearings (ball, as opposed to roller on the later cars) are the same as the transmission output shaft! Replace axle bearings, thrust washers, pinion bearing and seal, and replace all shims. Check that the teeth are properly engaged according to the shop manual. Lubricate all parts freely with 90 wt. If you can't find a cover seal, silicone works very well here. Check for any axle play, and make sure all bearings have tight tolerances. Clean Zirc fittings and make sure they are working properly before installing. New rubber mounting pads and bumpers are available.

Shocks. Fronts are easy, and new Armstrong 'Super Blues' reside within the coils of TS11308. The rear Armstrong lever-action units give many years of trouble free service. Chances are, yours are ok. I took mine to McAfee & McKenzie for rebuilding and revalving to give a softer ride. They can also be re-valved to provide a harsher ride, but kidney belts are not provided. I understand that MacII has since closed down, but that there is another outfit here in Burbank that can do the work. Check your local phone book for someone in your area (modern MG's still used a similar design in the front, so the demand is still there for these services). Check the linkage for worn bushings and rubber mounts. Check the shock mounting assembly on the chassis for stress cracks.

Brakes. The early TR's used 9" drums on a Lockheed system. The 3's used

10" drums up until the disc brakes were introduced (just weeks after my car was built). Brake parts are no problem. I have bought all new shoes, cylinders, and hoses. These are available from Import Motor Parts.

Wheels and Tyres. The original 48 spoke wheels were in good shape, and they went into Valley Wire Wheel Service, along with the tires and tubes. Virtually al the spokes were replaced (not because they were bad, but because the need to be c out when the adjustment nuts are rusted shut), the rim stripped, the center hubs replaced on two of the wheels (worn splines from improper lubrication and loose knock-offs), reassembled and painted, the tires mounted, and the rims and the tires trued. The tires are Denman wide whitewall bias-ply 6.00 X 15's. (They should keep any side-stress from being transmitted to the early rear axle shafts and bearings- the car will just slide!). This means that the car will rid and handle as it did when new. Watch out! (The tires are from Lucas Automotive in Long Beach). The wheels and tires were the most expensive single assembly on the whole car. They ride on a full set of splined hubs (no bolt-on adapters), three of which are in good shape, while the right front is marginal. Anyone out there have one? A good spline looks like this ∧ , where a bad one looks like this ⌒. Top dollar paid.

The chassis is now assembled, and the car is sitting on it's own wheels, as pictured on the 1981 yearbook cover. The engine has been started with the trans in each of the gears, and the overdrive manually engaged, and everything works quietly and properly. The next installment will cover the body work.

Steve Hedke
Newsletter #19

THE RESTORATION OF TS11308LO

THE BODY - PART I

Body shell EB11178 probably should have been a write-off. The floor was severely rusted, including good portions of the inside scuttle panels. All fenders (wings, if you will) were dented, rusted, and one had been burned. The lower rear apron was rusted through in several spots, and flaking inside. Both dog legs had holes all the way through to the inner body, as well as the fender wells. Some bonehead had jacked the front of the car up with a floor jack - on the lower lip of the front apron! Surface rust left scars in all panels. The trunk lid corners had rusted through in several spots. Etc, etc...

So what made me decide to fix it? Stupidity, stubbornness and pride had alot to do with it, but basically I wanted it tough, so I could say that I have done every possible type of bodywork on the TR. Besides, it could have been worse: the side sills and tub structure were sound, and the car had never been hit. So the decision was made to fix the original body. A word of advice: if you can possibly avoid it, don't go to this much trouble! Get a clean body to start with, if at all possible.

The first step was to have the body dipped to remove rust and allow the disassembly of body panels. This was done by I&M Strippers in Van Nuys, and they do excellent and careful work. The process removes all paint, Bondo (and aluminum- make sure all pot metal and aluminum parts are removed first)and rust, yet does not harm rubber or wood. They prefer that as many panels as possible be removed, so that all surfaces can be sprayed and treated. Doors are not dipped as long to prevent the wood from expanding. This process is the best way to clean engine blocks, too.

Have the body dipped on a period of nice, dry weather. Once that exlellent red gorilla primer that Standard put on is gone, the race against surface rust begins. The stripping process only takes a few days, then the metal is treated with a chemical that will retard the corrosion. Clean steel will begin to corrode immediately! Be ready. You will need a solvent and a lot of rags to clean the residue. Prep-sol works well, as does synthetic enamel reducer if you are on a budget. Clean and prime all surfaces immediately. Don't use a cheap primer. I found that Bondo-brand red oxide primer works the best. It sprays well, and is easily sandable. Buy lots. The primer was the single most expensive part of the bodywork. Don't worry about areas that need bodywork yet- just get it primed, all surfaces. Do the outer surfaces first. If there is any corrosion forming, make sure that it is on an inside surface, since you can't work that fast. Help at this stage would help (is that redundant, ed.?); have lots of beer on hand.

Continued

Estimate how big a glob you will need to cover the area, but not necessarily fill it. Take your creme hardener (which should come with the can of Bondo in all cases - if not, go back and ask for it) and lay a bead the length of the glob. Mix it thoroughly until the glob has an even pink color. Too reddish indicates too much hardener, which results in the Bondo being too brittle and likely to fall out. Too grayish indicates not enough; it'll take forever to set, if at all. Don't get paranoid about it...there's plenty of margin for error. Once it's mixed, get it on and don't waste time. In about 3 or 4 minutes it will start to cure (get rubbery or lumpy). When that happens, stop. It is too late to do any more shaping.

Apply the Bondo with a plastic spreader. They are cheap, so get several sizes to do different jobs and areas. Spread the Bondo on with a smooth sweeping motion using the spreader as a squeegie. DON'T TRY TO FINISH THE WHOLE AREA AT ONCE! You want to cover the whole area in progressively more coats. Sometimes it takes 6, 7, or more thin layers to do it right. This is very important to the final shape and the longevity of the patch. After laying the thin coat in place, stick the spreader with the extra Bondo into the glob remaining on the pallete. After it all hardens, the excess will stick to the pallete and not to the spreader.

When the patch starts to feel rubbery or stiff to the touch, take your surform tool (looks like a cheese grater) and plane off the high and rough spots. This makes later sanding easier. Don't take off too much, and the Bondo should be resilient but not yet hard (the consistency of cheddar cheese). You have only a few minutes to do this as it cures. Do nothing else until the Bondo is completely hard. On a warm day, this will take only 15 to 20 minutes, maybe less. If you attempt to sand it too soon, you will just be wasting expensive sandpaper as it loads up. Clean your tools or have a beer. Bodywork is a 3-5 beer job!

Now that the Bondo is hard (and you're half in the bag), it's time to sand. Use your drill and pad with medium grit paper and start to shape the patch. Don't expect to have a perfect shape yet, just smooth out the rough stuff to make the final sanding easier. When you're tired of that, get your sanding block (use the rubber kind) and start final shaping. After a while, you may see low spots or air holes. Continue to apply thin coats of Bondo as outlined above until the desired shape is achieved. If the car looks like a '58 Buick, you have made a mistake. If you are going to undercoat floor, doors, etc., do it now - after Bondo and before paint.

A few general notes on Bondo. Don't cover cracks or seams in the metal, as the bondo will crack. When spreading, these areas can be covered, then trimmed out with a knife at the rubbery stage. When finished (or between applications overnight), re-prime the area. This should show any imperfections. Many pros will spray a light coat of black paint on the area, then sand it down with a block and fine paper. If any black is left, that is a low spot. Remember, the key to successful home bodywork is thorough preparation and taking the time necessary to do the job as often as it takes to get it right.

Continued

Once the car is smooth, beautiful (or acceptable), and primed, it's ready for paint. First, determine the color you want. With the body off the chassis and no $$ spent on the interior yet, you are unlimited by any factors other than taste and money. At this point you have several options. If you have access to a compressor (big) and spray gun, and a well-lit, dust-free place to do it, you may wish to try to paint it yourself. I would advise against this unless you have had some experience with painting. After all that hard work, the money you would be saving just isn't worth the risk of a lousy job. Besides, modern paints are expensive. A gallon of DuPont Centari (an excellent acrylic enamel), with its reducer, hardener, etc. will cost you an easy $75-100.00! Add that to the cost of the other materials and it may not be worth the risk.

Prices on paint jobs vary widely. What will your budget (and bodywork) take? My car was so rough, virtually every inch of the skin would have had to be coated in Bondo. Since I didn't want to do that, certain areas of my car are not exactly perfect, although it looks good from anything more than two feet away. Since the body is heavily patched and Bondoed, I couldn't see spending $1000 on paint, yet I wanted a nice shiny, smooth surface. I trailered the body (with doors, hood and trunk lid attached) to Car-Coa for a $200 Special. They matched the color I wanted almost exactly, and had it done in one day. This included the inner fender wells, cowl, floor, trunk, and all areas inside and out. There was no orange peel or runs, but there was some dust in the paint on the trunk lid (Joe Shepherd had the same problem on BB TR3 with Car-Coa). As I was planning a luggage rack here anyway, I didnt mind too much. The painter had used too much hardener however, and the paint is very brittle and scratches easily. Such is the compromise you make in saving money!

But the body came back shiny and looking very good, which is what I wanted. Now I can drive my car anywhere, and if something happens to the paint or body, I won't be too upset. A scratch on a $200 paint job is far less painful than on a $2000 job! It's your choice. Decide how you will use the car, how much you can spend, and how good you want it to look. My car looks darned good for having been such a junker, and it turns its fair share of heads, for only about $500 total in body and paint work. Trim is another issue, but first let's put the body on the finished chassis!

Materials list for home body work

1. Primer (lots)
2. Sandpaper - lots of Medium (150), lots of fine (wet or dry), 400 or 600 wet or dry
3. Sanding disc for electric drill (do you have a drill?) Adhesive sanding disc paper
4. Surform tool (grater)
5. Bondo. Available in anything from pints to 55-gal. drums. Gallon size is probably best.
6. Spreaders (get different sizes)
7. Slide hammer - for pulling dents in rear apron, etc.

Steve Hedke

If you've been following the story this far, you know that we now have a finished, running chassis and a painted body shell. Finally, after all these years, the car is now starting to come together.

Mounting the body is not difficult. It only takes four people to lift the whole assembly, and it is done in a matter of minutes. Make sure that you have all the mounting bolts, packings and spacers that you will need laid out and ready to go, just in case you need the borrowed muscle to wiggle the body around for bolting in.

From this point on to driving, it is just a matter of attaching parts and bringing systems to life. There is no set order for this, but it is generally easiest to start with thos things you need to make moving the car easier (yes, you can start to refer to the assembly as a car now!). The steering column, support brackets, and pedal assemblies are first. Then, the parking brake handle is re-installed (unless you dropped the body on it while still attached...not recommended, as it does make the procedure a tad more complicated.). This should give you steering and brakes.

Next, I would advise the hydraulics. Use new flexible hoses and steel lines wherever needed. Take your time with the lines and cylinders so that they are routed properly and are correctly tightened and secured. This is especially necessary if you are using silicone fluid, as it will seep out of the smallest gaps. Silicone was chosen because it does not harm paint, and it prevents moisture buildup in expensive part (like Lockheed master and wheel cylinders...I was fortunate enough to be able to use all new Lockheed parts throughout the system, and I don't want to have to replace them!).

Now we have clutch (make sure that the proper return spring, etc. are used), brakes, steering, and a burning desire to go for a drive! Not quite yet. Hold the temptation and do it right. Next is the fuel system. My tank looked as bad as the floor it was mounted on. I took it to a sheet metal shop where they welded on a new tank bottom. Those of you with lat model 3A's can order a new tank, and I would advise this. At the very least, you will need to have the tank dipped (same place as the body, or some radiator shops can do it for you), then coat in a sealer. Fuel-proof sealer is available in motorcycle shops, and it serves a very important function. Surface rust and pitting inside an old fuel tank will give you a constant source of very fine rusty silt that will pass throu any filter you can use, and will clog up your carb jets every 500 to 50 miles! The sealer will prevent this by forming a plastic coating within the tank. It's easy to use...just pour it in and slosh it around until it covers all the inside surfaces. Let it dry, then install the tank.

Continued

RESTORATION OF TS 1130810

Steve Hedke
Newsletter #23

One of the biggest tricks in re-trimming a TR-3 is knowing where to buy your parts, and what is a good price. If you take your time, you can acquire these parts over the time that you are working on other components. When Roadster Factory runs a sale on items you need, go for it! The first new trim pieces I got were new stoneguard 'feet' that I won in a contest at a club function three years before I needed them! Here is a partial list of my sources, and what they are best at supplying:

The Roadster Factory (Armagh, Pennsylvania): Any and all items that would normally have been dealer items only. Stoneguards, wiring, upholstery, books, bumpers, cubby boxes, and all kinds of things too numerous to mention. If you don't have their TR "Restoration Checklist", get one.

Import Motor Parts (Van Nuys, CA): Besides the usual engine parts, they have Lockheed and Girling hydraulics, Lucas electrical, and a source for AMCO, fender beading, and hood hinges CHECK HERE FIRST! Save the freight charges from Pennsylvania, and their prices (especially on Lucas) are tough to beat. They will also do quick rebuild service on generators and starters, to the highest "Standards". (har, har - ed.)

Carter Plating (Burbank, CA): Top quality chrome plating, as well as bumper straightening. Never assume that your bumper is too far gone! Good service!

Joe Factor Sales (Burbank, CA): Aircraft-grade surplus bolts, screws, washers, etc., by the ton, at salvage prices. Proper fine-thread bolts in any length, in stainless or cad-plated, at like a dime a pound! Bring samples to match. Strictly self-serve, but worth it! Marty and I even found our defroster hoses here. Also, big selection of braided hoses, springs, rivets, etc.

Swap Meets:
Pomona fairgrounds - huge, start early. Not many TR parts, but the ones you do find are cheap. Held 4 times per year.

Sports/Foreign Autofaire, Los Alamitos - watch our newsletters for this one. Many of our members have joined at our club stand here (including our current Prez!). Strictly for sports and foreign cars, and usually offering a good TR parts selection. Held twice a year.

Rose Bowl Antique Car Swap Meet - similar to Pomona, but usually has more foreign parts. Held 3 to 4 times per year

IF THESE SOURCES CAN'T GET IT FOR YOU, IT MUST REALLY BE TOUGH

That includes very tough items like teardrop escutcheons ...check the other club members; several have parts cars. Place ads in the Trib, as well as the other club publications. (Send ads to the editor; he'll do the rest - ed.)

Finally, note the sources not listed above: Moss Motors, Nichols, BL dealers, etc. I'm sure we all have lists of suppliers we will not deal with again.

In order to license your car, you must first have a smog certificate. To get it, you must drive the car to a smog station for testing. This requires a Temporary Operating Permit from the DMV. To get this permit, you must fill out a certificate of non-operation if the registration has lapsed (my car hadn't been registered since 1966), and present a title and a Bill of Sale. Confused? Then join the Auto Club. Even if this is the only time you can use them, it'll be worth it! They can do all the paperwork, without you having to wait in those huge lines at the DMV.

Now that the Auto Club has all the paperwork done, all you need is that smog sheet. If you're chicken, take the car to a "blue shield" smog station, pay the $35.00 or so, then take it to the State testing station. You still pay the State testing fee ($12.00 last time I did it), but you'll pass automatically. The emissions standards are rather loose, however, and a properly set-up car should pass easily. Mine did, the second time; the first time it was too lean! I had it running so clean that their machines couldn't register, and they failed me! Great system, isn't it? Just set the car to factory specs, and it should do fine.

The next installment will be the last in the series

Repairs Time Scheaule

TRIUMPH SPORTS CAR (Model TR2)

ENGINE

Operation No.	Description	Time Hrs.	Mins.
S.E. 1	Valve Rockers, adjust only		20
S.E. 2	Tune up engine including the cleaning and re-setting of sparking plugs and distribution points, the cleaning of carburettor jets, adjusting valve rockers slow running and ignition timing		50
S.E. 3	Decarbonising engine and grinding in valves	4	30
S.E. 4	Drain oil from engine, flush out sump and refill		10
S.E. 5	Exhaust Manifold, remove and replace with new gasket (L.H.S.)	1	0
S.E. 6	Exhaust Manifold, remove and replace with new gasket (R.H.S.)	1	50
S.E. 7	Cylinder Head, remove and replace with new gasket	1	15
S.E. 8	Valve, replacing one, including removal of head, replacing and adjusting rockers. Extra for each additional valve, 10 minutes	1	30
S.E. 9	Valve Guide replacement, extra when decarbonising or change valve		10
S.E. 10	Valve Rocker or Shaft removing and replacing, including re-adjustment of rocker clearances		45
S.E. 11	Pistons and Big End Bearings, fitting complete set	4	0
S.E. 12	Cylinder Sleeves additional to S.E.11, per complete set		30
S.E. 13	Main Bearings, additional time when fitting new big end bearings	1	0
S.E. 14	Oil Pump, remove, replace and clean sump	1	0
S.E. 15	Oil Pump overhaul, additional when carrying out S.E. 14		30
S.E. 16	Sump, engine remove and replace		30
S.E. 17	Oil Filter or Joint, remove and replace		30

ENGINE — *continued*

Operation No.	Description	Time Hrs.	Mins.
S.E. 18	Oil Pressure Release Valve, examine and adjust		15
S.E. 19	Distributor Contact Points, adjust and clean		15
S.E. 20	Distributor and Oil Pump Shaft, to replace		40
S.E. 21	Ignition Timing, to check and re-adjust		20
S.E. 22	Ignition Coil, to replace		15
S.E. 23	Carburettor, to exchange or fit new washer		30
S.E. 24	Dynamo, to remove and replace		40
S.E. 25	Starter Motor (L.H.S.), to remove and replace		40
S.E. 26	Starter Motor (R.H.S.), to remove and replace		50
S.E. 27	Fan Blades, to remove and replace. (Includes removal of radiator and cowling)	2	30
S.E. 28	Starter Solenoid, to exchange		10
S.E. 29	Water Pump, to remove and replace	2	0
	Additional for overhauling	1	0
S.E. 30	Fan Belt, to replace		20
S.E. 31	Fuel Pump (L.H.S.), to exchange		30
S.E. 32	Fuel Pump (R.H.S.), to exchange		20
S.E. 33	Rocker Cover Gasket, to exchange		15
S.E. 34	Air Cleaners, to remove and refit		30
S.E. 35	Thermostat, to remove and refit		30
S.E. 36	Sparking Plug Cables, to renew		20
S.E. 37	Valve Timing, to check		30
	Additional for re-timing	3	30
S.E. 38	Timing Cover Joint, to replace	2	15
	Oil Seal, additional for replacing		15
S.E. 39	Timing Chain Tensioner, to replace	2	25
S.E. 40	Starter Dog and Pulley, to remove and replace	2	0
S.E. 41	Timing Chain, to remove and replace	3	30
	Camshaft, additional for replacing	1	30
S.E. 42	Engine and Gearbox, remove and fit replacement engine including changing over ancillaries	10	30
S.E. 43	Clutch Pedal, to adjust		15
S.E. 44	Flywheel, to remove and replace additional to S.E. 45		30
S.E. 45	Clutch, to remove and replace	5	30
S.E. 46	Overhaul, additional to S.E. 42, fitting replacement parts only	10	0

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GEARBOX

Operation No.	Description	Time Hrs.	Mins.
S.G. 1	Unit, to remove and refit	4	30
	Unit overhaul additional to removal	6	0
S.G. 2	Front Oil Seal, to renew. (Includes removal of unit)	5	0
S.G. 3	Speedometer Pinion, to remove and replace		20

REAR AXLE

S.A. 1	Unit, remove and replace	4	0
S.A. 2	Propellor Shaft, remove and replace		40
	Additional to above for overhaul	1	0
S.A. 3	Rear Hub Bearing, to replace	1	0
S.A. 4	Rear Hub Oil Seal, to remove and replace	1	0

FRONT SUSPENSION AND STEERING

S.S. 1	Front Suspension Unit, to replace each	1	30
S.S. 2	Steering Unit, to remove and replace	2	50
S.S. 3	Front Wheel Track, to check and adjust		20
S.S. 4	Front Wheel Bearings, to exchange and adjust. Each wheel		30
S.S. 5	Front Wheel Bearings, to adjusting		15
S.S. 6	Front Spring, remove and replace. (Includes Shock Absorber)	1	15
S.S. 7	Front Shock Absorber, remove and replace		30
S.S. 8	Steering Wheel, to remove and replace		30
S.S. 9	Rocker Shaft, to adjust		30
S.S. 10	Inner Column Bearings, to adjust		20

CHASSIS

S.C. 1	Rear Shock Absorber, remove and replace each		20
S.C. 2	Rear Spring, remove and replace each		45
S.C. 3	Front Cowling, remove and replace	1	50
S.C. 4	Radiator Block, remove and replace, additional to S.C. 3		20
S.C. 5	Top Water Hose, remove and replace. (Includes Thermostat Housing)		30

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CHASSIS — *continued*

Operation No.	Description	Time Hrs.	Mins.
S.C. 6	Bottom Water Hose, remove and replace		20
S.C. 7	Petrol Tank, to remove and replace	1	10
S.C. 8	Silencer, to remove and replace		30
S.C. 9	Exhaust System (excluding manifold), to remove and replace		20
S.C. 10	Exhaust Tail Pipe, to remove and replace		20
S.C. 11	Exhaust Flange Washer, to replace		30
S.C. 12	Petrol System, to clean		30
S.C. 13	Thermometer Gauge and Capillary Tube, to exchange		40
S.C. 14	Speedometer Head, to exchange		20
S.C. 15	Speedometer Cable, to change		15
S.C. 16	Oil Gauge, to change		15

ELECTRICAL

S.E. 1	Headlamp, to change		20
S.E. 2	Warning Light, to replace. Bulb only		5
S.E. 3	Petrol Gauge (Dash), to replace		15
S.E. 4	Petrol Gauge Unit (Tank), to replace		30
S.E. 5	Dynamo, to exchange		40
S.E. 6	Starter Motor, to exchange		30
S.E. 7	Steering Column Control Assembly, to exchange		20
S.E. 8	Wiring Harness, removal and refitting when removing body from chassis	8	30

BODY

S.B. 1	Body, to remove and remount on chassis	8	30
S.B. 2	Door, to remove and rehang. Each	1	30
S.B. 3	Door Lock, to remove and replace. Each		45
S.B. 4	Windscreen Assembly, to remove and replace with mounting brackets		30
S.B. 5	Windscreen, to reglaze	2	15
S.B. 6	Seat Assembly with Runners, to remove and replace. Each		30

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Creature Comforts.

Broadly speaking, TR owners fall into one of two camps. There are the owners who are obsessed with authenticity, and the owners who believe you can do whatever you want in terms of modifications. If you fall into the first category, read no further. If you read with interest the articles about rack and pinion steering, read on.

So how much should you modify your TR? I heard of one chap who put a Toyota engine in one which seems to me to be moving too far away from the original concept. I guess the real question is what do you want to do with the car. If you want to turn it into a dragster, a Merlin engine might be justified.

For me, after driving a TR for a quarter of a century, I want a reliable car which I enjoy driving to work each day, with a few creature comforts which have become available since the 50's. If it is not strictly authentic, so be it. I don't use 1959 formula oil in the engine, cross ply tyres, and long ago, I gave up riveted brake shoes. If the TR3A was still made today, what would Triumph have updated.

This is my top ten mods which may have the purists cringing, but which make life for the daily traveller, stuck in traffic jams, bearable.

Gearbox. About ten years ago I put in a Triumph 2500 gearbox with synchro on first gear. I had been dealing with the missing tooth on the cluster on almost an annual basis for years when Allen Mitchell talked me into a later model box. I now change the oil annually, not the gear.

Heater. Yes I know it was an option, but try and find an original donut heater. I installed a Smiths Universal heater which keeps the circulation going even with the top down. One day, I will organise the demisters which would be a major improvement.

Interior Lights. After groping around in the darkness on more occasions than I care to remember, I put a light under each side of the dash. I also ran a wire through the door and have a light in the side pocket to find the elusive bonnet key when you break down after midnight.

Boot Light. I found a boot light at a wrecker which has a built in mercury switch. it is attached to the cross braces in the boot and saves much groping around in the dark.

Under bonnet light. As TR's do have a habit of dying at the most inconvenient time, I installed a stainless steel 4 inch diameter spreader light from a boat supplier.
It has it's own switch under the bonnet and I find I often use it for simple things like checking the oil, or topping up the radiator at night. It is mounted near the bonnet catch with a screw into the front channel. The switch is near the master cylinder and takes power from the fuse box.

10.

External Mirror. Occasionally when the hood goes up, I think of all the scratched rear windows on soft tops and how the drivers cope with not seeing what is happening behind them. I long ago mounted an external rear view mirror. Essentially, I used the forward windscreen mounting screw to attach a spacer (about 1.5 cm) and a stainless steel plate to which the mirror attaches. It could be made more beautiful but what the hell - it works.

Incidentally, stainless steel bolts from a ship chandler are good for replacing windscreen screws. I have aero screens but not the original Dzus fastened windscreen. The bolts make windscreen removal quick and clean.

Air Horns. It is amazing how many blind drivers there are on the road who cannot see cars beside them when they change lanes. Fortunately only a few are both blind and deaf. The air horns help with the ones who are only visually disabled.

Electric Fan. I might only use this a few times a year, but driving to work in Sydney every day means the odd brush with a mobile parking lot. I have sat in the TR for over an hour and advanced one or two kilometres. That is where an electric fan mounted in front of the radiator is a welcome accessory.

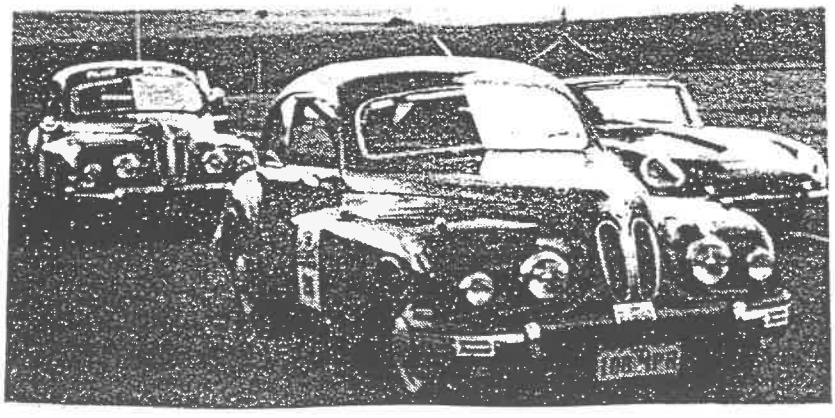
Wiring Connectors. Having wired about a dozen TR's over the years, and carried out trouble shooting on a multitude of electrical problems, I have no love for the original bullet connectors. Several years ago, I replaced most of my connectors under the bonnet, and in the boot with multi plug connectors as used on most cars today. Not only has it removed most electrical connection problems, but the fiddling spent trying to decipher cryptic notes on bits of masking tape when replacing the front apron are gone.

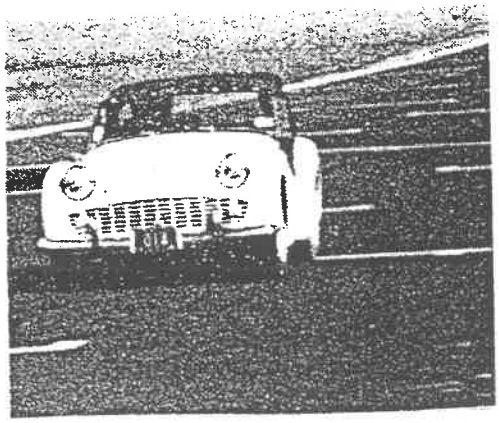
Wipers. This is one I have not yet done, but I believe there is a two speed wiper available from 60's British cars which will fit the TR. Maybe in the next 25 years....

That ends the top ten. The purists may not like it but I think of it as what Triumph might have done had they released a TR3A SLX model.

Neville Turbit.

##########





Speaking for myself, I have always admired a really nice pair of Bristols. The pair above are as nice as I've recently seen. The 3a pictured on the right is that of Ross Johnson caught at

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the REPCO Rally. mm

16.

Reflections on a Restoration
Rick Fletcher

Here are some reflections on the restoration of my TR2. Maybe this will help you in a projected restoration - I can certainly still remember the great thirst for information (as well as the amber fluid!).

I am not endorsing the following companies or services but simply indicating that they provided for *my* needs. There are other companies who probably provide as good or better service.

I also wrote down some obscure part numbers, sizes, details and other probably useless trivia - so you are about to cop an eyeful of that as well !

There is no logical sequence in what follows and remember that it refers to a **TR2** although some services are generic.

- Upholstery materials & hardware, fibre board, Plastifelt (patterned black vinyl with felt backing)

  Daleys
  297 Canterbury Rd
  Revesby 02-792 1155

- Fasteners, pipe clips, captive nuts & other goodies:

  Rageem Fastener Co PL
  Rear 407 Princes Hwy
  Rockdale 2216 02- 599 3132 FAX 02-597 2673

- Carburettor bits: Carburettor Service Co.
  240 Parramatta Rd Burwood 2134 02- 747 4066

  MIDEL PL
  4 Frazer St Lakemba 02-759 5598

- Shock Absorber repairs:

  Proven Products
  Byron & Cann St Guildford 2161 02-632 5479

- Brake repairs, pipes made etc.

  Brookers Brake Service PL
  3 Mellor St West Ryde 2114 02-807 1466

- Nuts & Bolts wide range:

  Lee Bros PL
  6 Dunlop St
  N Parramatta 2151 02-890 1555 FAX 890 1480

- Upholstery materials:

  Nolan Warehouses
  464 Gardeners Rd Alexandria 02-669 3333

- Paint stripping (chemical immersion):
  Metal Stripper Preparation
  7 Regent Cres
  Moorebank 2170 02-601 8829

- Gritblasting & aluminium coating:
  Comcoat Services
  1/33 Binney Rd
  Kings Park 02-621 6644 FAX 621 2370

- Wheel re-spoking and truing:
  Bill Graham
  28 Oswell St
  Rockdale 02-567 1668

Seamless steel pipe for stator tube (3/8 dia x 5'1" long)
Steel Store
20 Marigold St
Milperra 02-772 3800

- Headgaskets & all gaskets made off pattern (excellent work)
  Ron Swanson
  Unit 1 11 Kelray Pl
  Asquith 02-477 2427

- Driving lights, Lucas lights, accessories:
  Gary Grant
  5 Upper-Skene St
  Newtown Geelong Vic 3220 (Check Unique Car Mag)

- Plate onto die-cast
  Stonewall Jackson Electroplaters
  83 Cox Ave
  Kingswood 047-31 2967

- Rubber products, fasteners, upholstery bits etc.
  Peter Jacksons Old Auto Rubber Co.
  Lot 4 Appin Place
  Dunheved, St. Marys 02-623 5333 FAX 833 1041

Water pump bearings - SKF 402703c (2 req)
Oil Filter (TR2) Ryco R236P
Gearbox front bearing RHP MJ 1 1/4 NR
Starter Motor front bush 3/4" long X 3/4 OD & 5/8 ID
Universal Joint kit # S5L4R
Radiator hose - try cutting a section from a Commodore hose 37mm # CH1545
Heater ducting is 1,1/4OD - 1pc x 15" & 1pc x 2'2" (approx)
Rear axle oil seal #5077 (check this)
Cable from solenoid to battery - 1'4 1/2" cr. to cr. Lug at solenoid ID 5/16"
Block to body strap - copper braid - 9" long, holes dia 5/16" ea end.

removed the engine should not be turned over unless a clamping plate is fitted on top of the block in place of the head. The sleeves should stand proud of the top of the block by .003in. The best way to check this is to place an accurate straight edge across the top of the sleeve, then use a feeler gauge to check how much, if any, the sleeve is protruding.

Special, plastic-coated steel sealing rings are fitted, and once a seal is disturbed, by "breaking" the joint, it should be replaced, as these help to prevent the sleeves from sinking, and also ensure a good, watertight joint. If these aren't fitted properly, water will leak from the cylinder block water jacket into the sump. If the sleeves do not project the specified amount, the special sealing rings must be replaced.

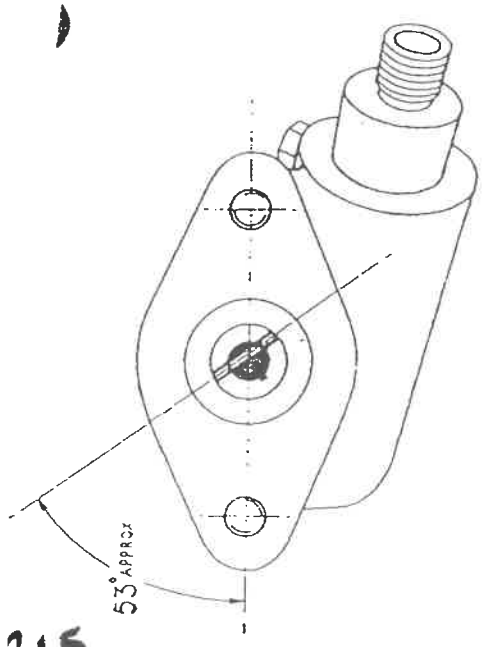
There are three piston and cylinder bore dimensions, and these are identified by the markings "F," "G" and "H." Size "F" is 3.2676in., "G," 3.2680in. and "H," 3.2684in. The identifying letter of each assembly is stamped on the crown of each piston and on the upper flange of each cylinder sleeve.

Where the worn clearance between the piston skirt and the cylinder sleeve bore exceeds .007in. at the top and .005in. at the bottom, reboring or replacement is necessary.

The connecting rod should be fitted to the piston assembly with its bearing cap towards the split portion of the piston skirt and then should be assembled into the cylinder sleeve with the gudgeon pin in diametrical relation to pairs of opposite flats on the upper flanged faces of the cylinder sleeves.

When assembling the sleeve and piston into the block, position the bearing cap of the connecting rod towards the camshaft side of the engine, or away from the point of maximum thrust.

When slight wear occurs and causes piston slap, the noise can be reduced by withdrawing the sleeve



SLOT position in the distributor boss as No. 1 piston comes up to T.D.C.

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FAULT-FINDING CHART

● If engine is difficult to start, check for:

(1) Insufficient fuel owing to:
(a) Empty petrol tank.
(b) Restricted pipeline from tank.
(c) Dirty petrol-pump filter.
(d) Petrol pump not working properly.
(e) Choked carburettor jets.
(f) Incorrect carburettor level.
(g) Incorrect jet setting.
(2) Air leaks to the induction system owing to:
(a) Loose nuts on carburettor and induction manifolds, or distorted flanges.
(b) Defective manifold or carburettor gaskets.
(c) Leakage around crankcase ventilation adaptor in induction manifold.
(d) Cracked induction manifold.
(e) Worn throttle-valve spindle and/or bearing point in carburettor.
(f) Worn valve guides.
(3) Defects in the electrical system as follows:
(a) Battery worn out or flat.
(b) Incorrect ignition timing.
(c) Weak or "earthed" condenser.
(d) Incorrectly adjusted or dirty and pitted contact-breaker points.
(e) Sticking contact-breaker arm due to seizure, or weak or broken springs.
(f) "Earthed" low-tension terminal on distributor head.
(g) Poor ignition-switch contacts.
(h) Poor contact between high-tension terminals and spark plugs.
(i) Faulty insulation of high-tension cables.
(j) Moisture on distributor cover or leaks due to cracks.
(k) Unsuitable spark plug or incorrect setting of electrodes.
(l) Plug porcelains cracked.
(m) Corroded rotor contact or distributor segments or "earthed" rotor.
(n) Carbon brush for distributor to coil cable missing, damaged, or stuck.
(o) Starter motor in poor condition.
(p) Starter motor switch not operating properly.
(6) Starter motor pinion not engaging freely with flywheel ring.
(7) Engine compression poor owing to:
(a) Loose spark plugs.
(b) Damaged or improperly fitted cylinder-head gasket.
(c) Valves require regrinding and/or refacing, or valve seatings require attention.
(d) Weak or broken valve springs causing partially sticking valves.
(e) Bent valve stems.
(f) Incorrect valve-rocker clearances.
(8) Water in cylinders due to poor cylinder - head gasket or cracked cylinder block.
(9) Initial tightness of engine following recent overhaul; or improper lubrication.
(10) Incorrect valve timing.

● If engine power is poor, check for:

(1) Lack of compression due to the following:
(a) Valves not closing properly.
(b) Sticking valves.
(c) Weak or broken valve springs.
(d) Valve faces and/or seating in poor condition.
(e) Worn or damaged cylinder bores, pistons, and rings.
(f) Piston rings improperly gapped and slack in piston grooves.
(g) Faulty cylinder-head gasket.
(h) Plug washers defective.
(2) Improper ignition timing.
(3) Poor carburation.
(4) Dirty filter.
(5) Throttle valve not opening fully.
(6) Petrol pump not operating properly.
(7) Exhaust system clogged with carbon, causing back-pressure.
(8) Engine overheating.
(9) Pre-ignition.
(10) Tight pistons and/or engine bearings.
(11) Clutch slip.
(12) Incorrect valve timing.

● If engine misfires at low speed and when idling, check for:

(1) Incorrect carburettor level.
(2) Partially restricted main jet or pilot and its air bleed.
(3) Air leaks caused by badly made joints in the carburettor or in its attachment to manifold.
(4) Badly fitting throttle valve and/or spindle.
(5) Air leaks due to badly made manifold joints and defect in crankcase ventilator valve.
(6) Cracked induction manifold
(7) Electrical leakages due to insulation failures.
(8) Defective ignition coil.
(9) Defects in spark plugs.
(10) Poor engine compressions.
(11) Worn valve guides.
(12) Incorrect contact - breaker gap and bad condition of points.

TUNING DATA

Bore: 83mm.
Stroke: 92mm.
Capacity: 1991c.c.
Compression ratio: 8.5 to 1.
Maximum b.h.p.: 90 at 4800.
Firing order: 1, 3, 4, 2.
Oil pressure: 70lb./sq. in. at 2000 r.p.m.
Contact-breaker gap: .015in.
Spark-plug gap: .032in.
Ignition timing: 4deg. B.T.D.C.
Battery polarity: Positive earth.
Piston speed at 100 m.p.h. (4900 r.p.m.): 2850ft./min.

VALVES

Tappet clearance: Inlet, .010in. Exhaust, .012in.
Valve timing: Inlet opens 15deg. B.T.D.C. Exhaust closes 15deg. A.T.D.C.

TENSIONS

Cylinder-head: 100-105ft.-lb.
Main bearings: 85-90ft./lb.
Conrod bolts: 52-60ft./lb.

FRONT END

Caster: Nil.
Camber: 2deg. (loaded).
Toe-in: 0-1/8in.

This article should be read by all TR owners & particular notice should be paid to the information on diffs & gearboxes. Talk to Penrite for your particular requirements. mm.

VETERAN - VINTAGE - CLASSIC - LUBRICANTS

GINE OILS

LSLEY 30, 40, 50

Three specially blended mono-de engine oils for veteran and vin- engines.

We use a small volume of mod- additives combined with top ity base oils to produce good en- ne protection and the viscosity cteristics of the oils of the era.

Pre-1950 engines were designed use SAE 30, SAE 40 or SAE 50 oils.

All pre-1940 engines originally sed "straight" or non-additive oils ecause additives were not developed engines until then. The ad- antages offered by modern additives or controlling sludge, varnish de- ts, ring sticking, rust and cam o wear, were taken into account when we formulated SHELSLEY oils.

To provide optimum lubrication or all early engines which may not have been rebuilt, or which have been rebuilt for a long number of op- ng hours, SHELSLEY grades are d. ils to use.

HI SERIES

The "HPR Series" of Penrite oils are actually high performance, non- fri on modified, high viscosity mu i-grades designed for all modern four-stroke engines operating under Au ralian conditions.

However, there are two oils in he "HPR Series" which, due to their an ue characteristics, are ideally sui d for use in ALL RESTORED en- gines of virtually every era.

These oils are HPR 30 and HPR 0.

IP 30

A 25W/50 multigrade which typ- ally maintains a viscosity of 23.8 en stokes at 100°C, whilst being as to pump when cold due to the 5W base viscosity.

These characteristics make HPR 30 ideal for small capacity, fully-restored early engines and also those used in vintage or historic sprint races where the oil does not get to full operating temperature.

HPR 50

A 40/70 multi-grade which typically maintains a viscosity of 27 centistokes at 100°C and has the characteristics of SAE 40 when cold.

HPR 50 is ideal in all fully-restored large capacity engines from any era. It is used in high performance sports and racing car engines to provide ultimate protection to sometimes priceless machinery.

GEAR OILS

TRANSOIL 90, 140, 250

A series of three low-additive mono-grade gear oils rated at GL 1 for use in veteran and vintage gearboxes and differentials (in the appropriate viscosity).

Also for use where non-EP gear oil is specified.

TRANSOIL 90 and 140 are suitable for the majority of pre-1960 gearboxes, where the manufacturers specifies gear oil. In the cases where engine oils are specified, use SHELSLEY 40 or 50.

For rear axles, TRANSOIL 140 and 250 are suitable for all straight and spiral bevel gears up to the mid 30's.

You can mix TRANSOIL 140 with TRANSOIL 250 to arrive at a mid-range oil, if you wish.

In 1926, Packard introduced the first Hypoid gear in a rear axle and this bought about the use of additives in gear oils.

A NOTE OF WARNING:

Modern hypoid gear oils are designed to cope with the extremely high sliding loads on current hypoid gear sets. The additives in these modern gear oils will cause blackening and corrosion on brass and bronze components such as plain bearings (bushes) and thrust washers found in early differentials (and gearboxes).

Modern Hypoid gear oils MUST NOT be used in pre-1950 back axles and even in axles up to 1960; you should carefully ensure that bronze components are not used in the unit before using any modern hypoid oils.

SPECIALTY LUBRICANTS

STEERING BOX LUBRICANTS

Special semi fluid [redacted]se just pourable at ambient temp[redacted]ture, for use in all early steering boxes.

Provides correct lubrication without leaking profusely like gear oils and also slumps back on to the gears whereas grease will channel and allow gears to run dry.

SHOCK ABSORBER OILS

No's: 1, 2, 3 and 4

Each of these grades is different in viscosity and composition.

Some contain different additives and the base oils vary to provide the level of resistance and other properties required to match the original specifications of the manufacturer of the shock absorbers. These high grade mineral oils are designed for use in early piston, vane and plunger lever type shockers and knee action units, as well as refillable telescopic shockers.

No. 1 is the lightest, [redacted] 4 is heaviest.

Many shockers used No. 1 type oil when new, if they are in good condition now, continue to used this grade. Our recommendations relate to units in good condition.

It is better to recondition the shocker than to use heavier oil. We also recommend that a complete change of oil be made every 10 000 miles.

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MILD EP

For early hypoid rear axles from the mid 30's to the late 50's, we make Penrite MILD EP GEAR OIL. This is

SPECIAL TOOLS

CHASSIS	Part No.
Half shaft bearing remover—use press	S 4221
with converting ring and Tools Code No.	8 and 10
Half shaft bearing replacer	M 92
Differential casing spreader	S 101
Propeller shaft flange coupling wrench	20 SM 90
Pinion bearing outer cup removing driver	20 S 71
Pinion head bearing inner cone remover	TS 1
with converting ring SK/S 2089 and Tool Code No.	2
Pinion head bearing replacer with converting ring and Tool Code No.	TS 1
	9
Crown wheel carrier bearing inner cone remover	S 103
with	S 103/3
Crown wheel carrier bearing inner cone replacer	M 89
Pinion bearing outer cup replacer	M 70
Pinion setting gauge and dummy pinion	M 84
Axle casing oil seal replacer	M 29
Pinion bearing pre-load gauge	20 SM 98
Pinion oil seal replacer	M 100
Rear hub extractor (pressed wheels)	M 86
Rear hub extractor (wire wheels)	SK/S 2377/1 L.H.
use a suitable press with	SK/S 2377/2 R.H.
Rear hub replacer (wire wheels)	SK/S 2418
GEARBOX	
Gearbox mainshaft remover	20 SM 1
To replace mainshaft circlip use	20 SA-46
Front cover oil seal protecting sleeve	20 SM-47
Gearbox extension remover	20 S-63
Constant pinion shaft and bearing remover	20 S-66
with pinion shaft clamp	20 SM-66/2
Mainshaft circlip extractor	20 SM-67
Countershaft needle-roller retaining ring driver	20 SM-68
Mainshaft circlip remover	20 S-69
Clutch plate centraliser	20 S-72
To fit oil seal to front cover use	20 SM-73
Countershaft assembly pilot	20 SM-76
Needle roller retaining tube	20 SM-77
Installing tool for extension ball race	20 S-78
Constant pinion ball race remover	SK/S 2400/1
and Tool Code No.	7
Constant pinion ball race replacer	SK/S 2400/1
with press	4221 or 4615
and Tools Code No.	3, 5, 6 and 7
To replace mainshaft ball race use press with Tools Code No.	4 and 5
Installing tool for extension oil seal	20 S-87A

NUT TIGHTENING TORQUE DATA

	Bolt size	lb/ft
Cylinder head	½in UNF	100–105
Connecting rod caps	7/16in UNF	55–60
Main bearing caps	½in NC	85–90
Flywheel bolts	⅜in NF	42–46
Sump nuts	5/16in NC	16–18
Dynamo (to bracket)	5/16in UNF	16–18
Gearbox front cover (and rear mounting ¼in UNF	5/16in NC	14–16
Wheel studs and nuts	7/16in NF	45–55
Front hub to stub axle	*½in UNF	*
Rear axle bearing caps	⅝in UNF	34–36
Crown wheel to diff. case	5/16 in UNF	22–24
	⅜ in UNF	35–40
Hub to axle shaft	⅝in UNF	110–125

*Tighten and unscrew one flat.

moved with radiator *in situ* by taking one bolt and two nuts securing housing to block. Adjust tension of belt by swinging dynamo on bracket so that there is ¾in play in longest run of belt.

TRANSMISSION

Clutch

Borg and Beck single dry plate hydraulically operated. Ball race withdrawal bearing. Hydraulic

GENERAL DATA

Wheelbase	7ft 4in
Track: front	3ft 9in
rear	3ft 9½in
Turning circle	32ft 0in
Ground clearance	6in
Tyre size: front	5·50–15
rear	5·50–15
Overall length	12ft 7in
Overall width	4ft 7½in
Overall height	4ft 2in
Weight (dry)	17¾-cwt
Net weight	18¼-cwt

ENGINE DATA

No. of cylinders	4
Bore × stroke: mm	83 × 92
in	3·268 × 3·622
Capacity: cc	1991
cu in	121·5
R.A.C. rated hp	17
Max. bhp at rpm	90 at 4,800
Max. torque at rpm	116·5 lb ft at 3,000
Compression ratio	8·5:1

CRANKSHAFT AND CON. RODS

	Main bearings	Crank-pins
Diameter: in	2·479	2·086
Length: in	1·745	·967
Running clearance: main bearings	·0010–·0025in	
big ends	·0016–·0035in	
End float: main bearings	·004–·006in	
big ends	·007–·014in	
Undersizes	·010, ·020, ·030, ·040in	
Con. rod centres	6·250–·002in	
No. of teeth on starter ring gear pinion	117/10	

PISTONS AND RINGS

	Top	Bottom
Clearance (skirt)	·0054 to ·0057	·0032 to ·0037in
Oversizes	·010, ·020, ·030, ·040in	
Weight with rings and pin	1lb 5oz	
Gudgeon pin: diameter	·875in	
fit in piston	push fit	
fit in con. rod	floating	
Compression height	2·020in	

	Compression	Oil control
No. of rings	2	1
Gap	·003–·010in	·003–·010in
Side clearance in grooves	·001–·003in	·001–·003in
Width of rings	·062in	·156

CAMSHAFT

	Front	2 inter. & 1 rear
Bearing journal: diameter	1·872in	1·1157in
length	1 7/8–1 1/8–1 1/2–1 5/16in	
Bearing clearance	·0026–·0046in	
End float	·004–·012in	
Timing chain: pitch	¾in	
No. of links	58	

VALVES

	Inlet	Exhaust
Head diameter	1·558–1·562in	1·299–1·303in
Stem diameter	·3100–·3110	·3705–·3715
Face-angle	45°	45°
	Inner*	Outer
Spring length: free	2·08in	1·98in
fitted	1·45in	1·56in
at load	33lb†	33lb

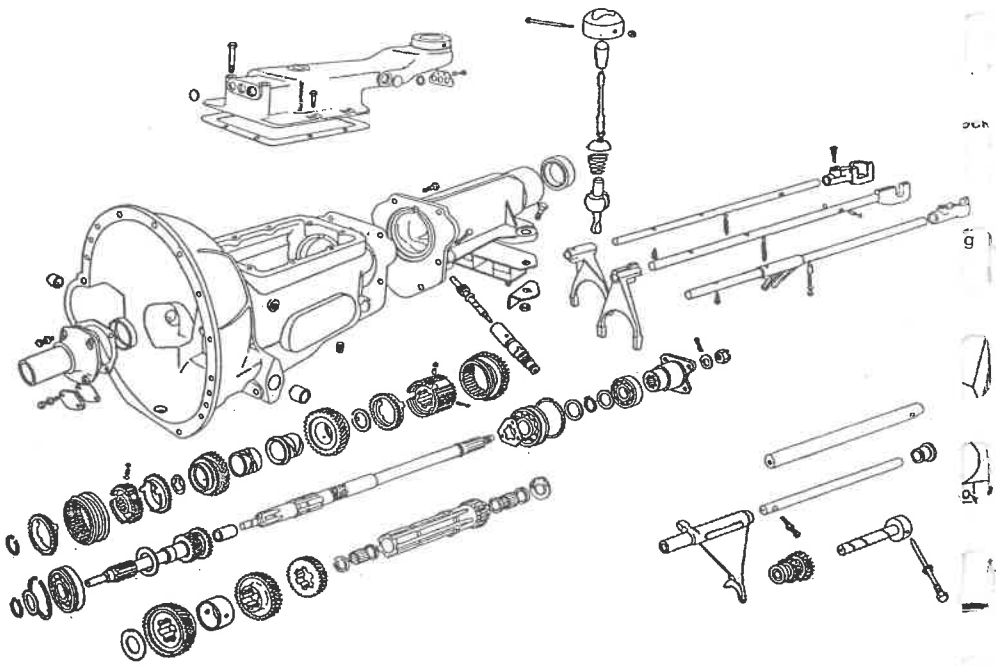
*Aux. inner spring exhaust: Free length, 1·54in fitted 1·14in at load 10lb

†Exhaust valve aux. inner spring, 36·5lb

ENGINEERING CHANGES

CHASSIS	Chassis No.
D.M.8 brake linings introduced. Fit in sets or pair up for use front or rear of car	
Disc wheels: front	TS 3212
rear	TS 3190
Wire wheels: front	TS 3248
rear:	TS 3200
Rear hub peg collar for use with wire wheels	TS 1604
Plunger, replacing ball for reverse selector shaft	TS 1201
ENGINE	Engine No.
Oil sealed petrol pump	TS 2074
Clutch shaft assembly	TS 411E
Radiator block assembly, with thermostat housing	TS 1201
New type exhaust valve	TS 481E
Cross drilled crankshaft improving lubrication	TS 881E

Gearbox, showing details of casing, gear trains selectors and remote control linkage.



CHASSIS DATA

CLUTCH

ake	Borg & Beck
pe	s.d.p. 8in
Springs: no	9
colour	cream
	114–130ths
free length	2·53
ntre springs: no.	3 red
colour	3 light grey
Linings: thickness	·14–·15in
dia. ext.	9·15in
dia. int.	6·125in

GEARBOX

Type	Synchromesh
No. of forward speeds	4
Final ratios: 1st	12·5
2nd	7·4
3rd	4·5
4th	3·7*
Rev.	15·8

*Overdrive top ratio–3·01 :1

PROPELLER SHAFT

ake	Hardy Spicer
Type	Needle roller UJ

FINAL DRIVE

ype	Hypoid
Crownwheel/bevel pinion teeth	37/10

BRAKES

pe	Lockheed 2 LS front

	Front	Rear
um diameter	10in	8in
ing: length	9·26in	8·66in
width	2½in	1½in
thickness	$\frac{3}{16}$in	$\frac{1}{16}$in
of rivets per shoe ..	12	12

SPRINGS

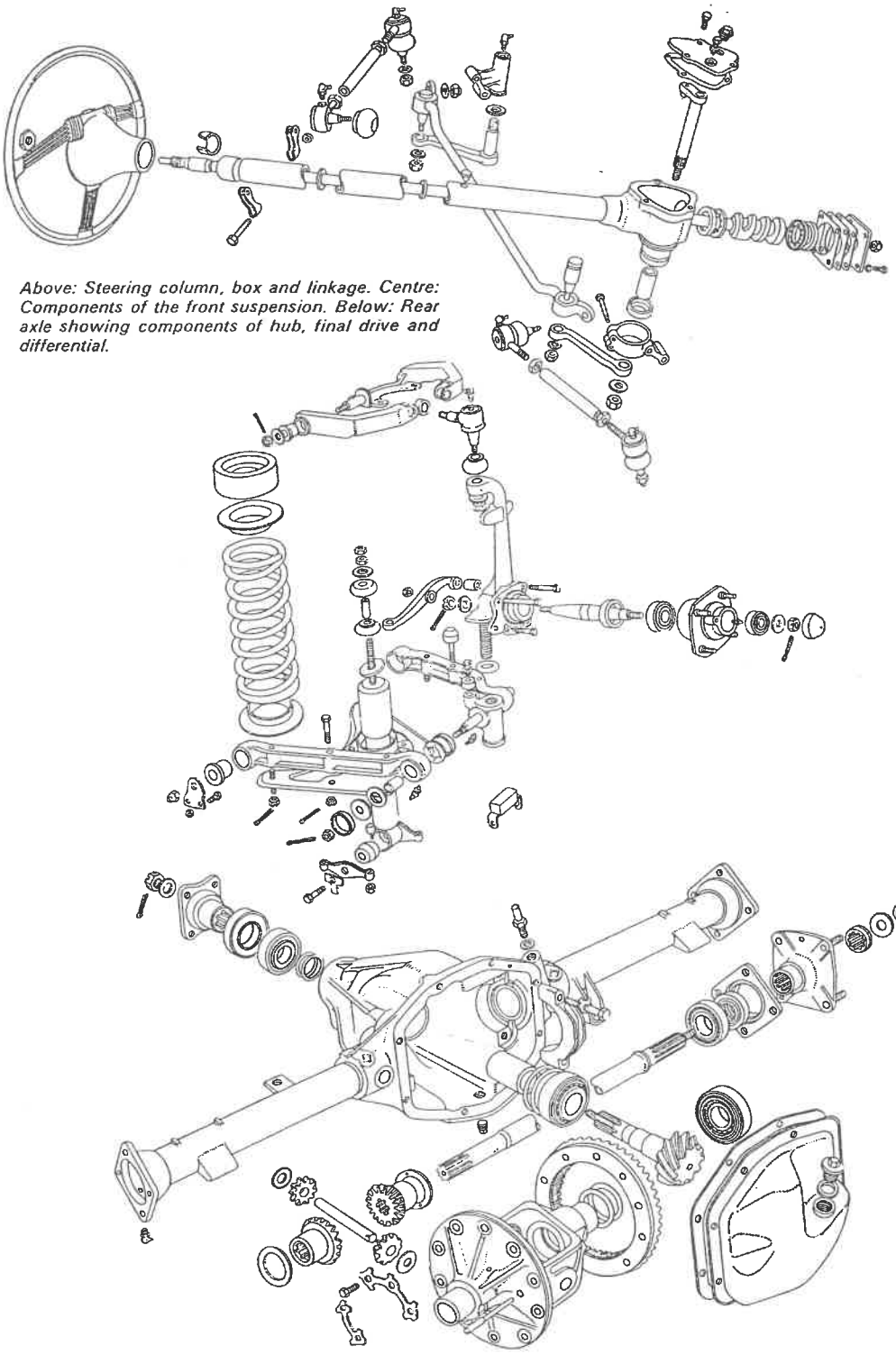
	Front	Rear
pe	Ind. coil	½ elliptic
ngth	9½in	41·0in
dth	3½in	2in
Wire/dia. of coils	½in	—
No. of leaves	—	6
aded camber	—	$\frac{7}{8}$in neg.
ed load (coil)	925lb	—

SHOCK ABSORBERS

Make	Armstrong
Type	Piston front (tele): double acting piston, rear
Service	Replacement fronts) Top up (rear)

STEERING BOX

Make	Bishop
Type	Cam and lever
Adjustments	
column end float	shims
rocker shaft end float ..	grubscrew and locknut



Above: Steering column, box and linkage. Centre: Components of the front suspension. Below: Rear axle showing components of hub, final drive and differential.

cylinder operating clutch is arranged with brake master cylinder, and adjustment of slave cylinder pushrod can only be judged at connection to shaft operating lever. Correct setting is for ·075in end float of body link between slave cylinder and clutch shaft lever when pedal is in free position. Adjustable connection between pedal and master cylinder set on initial assembly and must not be altered. Gearbox may be removed with engine in position for service to clutch. Take out floor centre section, disconnect slave cylinder and wire to overdrive if fitted, also front end of propeller shaft. Support rear of engine. Gearbox may be withdrawn into body of car.

Gearbox

Four-speed, synchromesh on 2nd, 3rd and top. Remote control by short central lever. After removal as previously described, dismantling procedure as follows :—

Remove top cover (eight $\frac{5}{16}$in setscrews, ½in AF spanner), complete with selector mechanism. Take out clutch operating shaft and fork, noting positioning bolt and grease nipple on offside. Remove release bearing, detach speedo drive. Remove propeller shaft coupling noting position, and take out six $\frac{5}{16}$in securing setscrews to remove rear gearbox extension. Oil seal and bearing remain in position but can be tapped out with drift.

Withdraw countershaft locating setscrew (½in AF spanner) and take out shaft cover end plate (two wired setscrews, ½in AF spanner). Drive out shaft to rear with tubular drift to retain 48 needle rollers in position. Detach gearbox front end cover and extract constant mesh pinion shaft and race together with mainshaft spigot bush located in the rear end, by tapping mainshaft towards back of box with soft metal drift sufficient to clear bearing from casing. Tilt mainshaft to enable 3rd and top synchro-hub to be withdrawn. Short boss on synchro-hub towards mainshaft circlip. Remove this circlip and take out 3rd and 2nd mainshaft constant gears and bushes together with three lug thrust washer which fits splines and 2nd speed synchro-hub. Take out mainshaft.

Remove circlip and thrust washer, which locates ball race on mainshaft and extract race and triangular plate behind. To remove reverse gear pinion and selector, take out locknut and locating screw when fork may be withdrawn. Steel insert located at rear and Welch plug at front of casing may be withdrawn as necessary. Tap out reverse pinion spindle to rear of casing and lift out gear. Layshaft cluster may be lifted out complete with tubular drift retaining 24 needle rollers at each end. Retain two phosphor bronze thrust washers for reassembly, if suitable. Layshaft gears may now be removed from splined part of shaft noting relative positions.

Assembly is reverse procedure of dismantling. End float of layshaft should be checked for clearance of ·006-·010in; if in excess of this new thrust washers must be fitted. If clearance less than above, thrust washers may be rubbed down on surface plate. Renew mainshaft circlip. When assembling check that following fits are obtained : Layshaft end float ·006-·010in, 2nd speed constant gear float on bush ·004-·006in, 3rd speed constant gear float on bush ·004-·006in. Overall bush float on mainshaft ·007-·012in.

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FRONT-END SERVICE DATA

Castor	Nil
Camber	2°
King pin inclination	7°
Toe-in	$\frac{1}{32}$in
No. of turns lock to lock	$2\frac{1}{4}$
Adjustments: castor	Nil
camber	Nil
toe-in	Screwed track rod ends

ELECTRICAL TEST DATA

Battery	
model	GTW 9A/2
voltage	12
No. of plates	9
capacity	51 amp at 10 hr rate
Spec. gravity fully charged:	
up to 80°F	1·280-1·300
80°-100°F	1·250-1·270
Over 100°F	1·220-1·240
Dynamo	
model	C 39 PV-2
service no.	22258
rotation (comm. end)	Anti-clockwise
cut-in volts at rpm	13 volts at 1,050-1,200 rpm
output volts at rpm	19 amps at 13·5 volts and 2,000-2,150 rpm
field resistance	6·2 ohms
brush tension	22-25 oz
Control box	
model	RB 106/1
service no.	37138
cut-out: cut-in voltage	12·7-13·3
cut-out voltage	8·5-11
regulator voltage:	
10°C (50°F)	15·9-16·5
20°C (68°F)	15·6-16·2
30°C (86°F)	15·3-15·9
40°C (104°F)	15·0-15·6
Starter	
model	M 418 G
service no.	25541
rotation (comm. end)	Anti-clockwise
lock torque (lb-ft-amps-volts)	17 lb/ft at 440-460 amps and 7·4-7·0 volts
torque at 1,000 rpm	8 lb/ft at 250-270 amps and 9·4-9·0 volts
brush tension	30-40 oz
Coil	
model	B 12
service no.	45012
stall current	2·9 amps
running current	1 amp

Overdrive

Where fitted, overdrive unit compares with that previously described in *Trader* Service Data 214 for dismantling and overhaul procedure. When fitted to the car it is solenoid operated by a switch on the facia.

Propeller Shaft

Hardy Spicer needle roller bearing universal flange mounting either end.

Rear axle

Hypoid bevel semi-floating. Final drive housing riveted to axle tubes, rear cover detachable. To remove axle jack up car, undo brake fluid pipes and cable operating bisector unit for rear brakes at clevis joint. Open out clamp and pull cable through. Remove brake drums and backing plates. Disconnect shock absorbers and rear end of propeller shaft. Undo spring U-bolts. Axle unit can then be removed from chassis on offside. For further information regarding dismantling procedure and assembly, see Service Data 180. Axles and differential assemblies are available as replacements from the manufacturers or their agents and should be used unless the complete range of special tools and gauges is to hand and facilities exist for comprehensive overhaul.

CHASSIS

Brakes

Lockheed two leading shoe arrangement at front with separate cylinder for each shoe. Leading and trailing shoes on rear wheels with floating cylinder incorporating bisector unit for cable operation through hand lever.

Micram adjuster on each wheel cylinder with slotted head reached through hole in drum *after removal of wheel*. Apply brakes hard to position shoes in drums, jack up car, remove wheel, turn adjuster clockwise until shoe touches drum and then back off one notch. Note, two adjusters for each front wheel, no separate adjustment for handbrake.

Rear springs

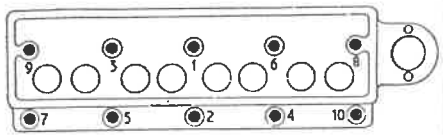
Semi-elliptic, bonded rubber-bushed anchorages, loose rubber bushes swinging end. Tighten bolts fully with weight of car on springs. Spring centre-bolts offset towards front.

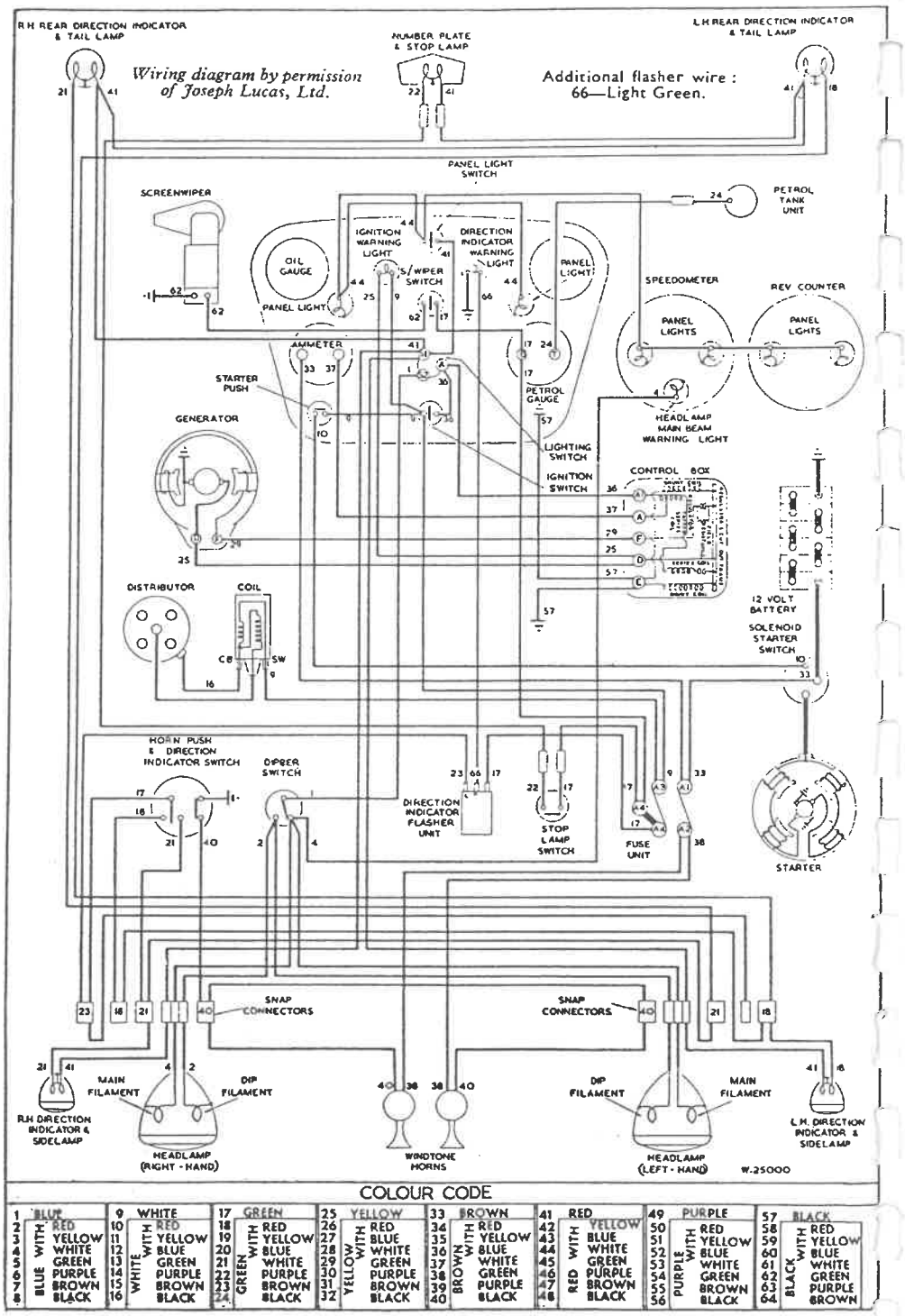
Front suspension

Independent, with coil spring and double wishbone link. Inner pivots of upper and lower links have rubber bushes. Stub axle pins spigoted in their respective vertical links and retained by nuts and split pins. Complete suspension assemblies are symmetrical and interchangeable from side to side except for steering arms. Upper end of each vertical link terminates in ball pin working in sealed ball socket bolted through both arms of upper wishbone. Lower end of each vertical link is threaded, working in bronze swivel housing. Serrated pin pressed into housing carries bronze bushed outer ends of lower link arms. Assembly on each side of housing consists of inner thrust washer with rubber seal, link arm, outer thrust washer with rubber seal (same as inner) registering in stepped washer with serrated bore, which fits serrations on outer end of pin. Assembly retained by plain washer and split pinned nut. Tighten nut until ·006in feeler is nipped between thrust washer and link arm giving ·004-·008in end float when nut is locked.

To remove spring (telescopic shock absorber

Diagram showing order of tightening of cylinder head nuts (see "Nut Tightening Torque Data").





COLOUR CODE

1 BLUE	9 WHITE	17 GREEN	25 YELLOW	33 BROWN	41 RED	49 PURPLE	57 BLACK
2 BLUE WITH RED	10 WHITE WITH RED	18 GREEN WITH RED	26 YELLOW WITH RED	34 BROWN WITH RED	42 RED WITH YELLOW	50 PURPLE WITH RED	58 BLACK WITH RED
3 BLUE WITH YELLOW	11 WHITE WITH YELLOW	19 GREEN WITH YELLOW	27 YELLOW WITH BLUE	35 BROWN WITH YELLOW	43 RED WITH BLUE	51 PURPLE WITH YELLOW	59 BLACK WITH YELLOW
4 BLUE WITH WHITE	12 WHITE WITH BLUE	20 GREEN WITH BLUE	28 YELLOW WITH WHITE	36 BROWN WITH BLUE	44 RED WITH WHITE	52 PURPLE WITH BLUE	60 BLACK WITH BLUE
5 BLUE WITH GREEN	13 WHITE WITH GREEN	21 GREEN WITH WHITE	29 YELLOW WITH GREEN	37 BROWN WITH WHITE	45 RED WITH GREEN	53 PURPLE WITH WHITE	61 BLACK WITH WHITE
6 BLUE WITH PURPLE	14 WHITE WITH PURPLE	22 GREEN WITH PURPLE	30 YELLOW WITH PURPLE	38 BROWN WITH GREEN	46 RED WITH PURPLE	54 PURPLE WITH GREEN	62 BLACK WITH GREEN
7 BLUE WITH BROWN	15 WHITE WITH BROWN	23 GREEN WITH BROWN	31 YELLOW WITH BROWN	39 BROWN WITH PURPLE	47 RED WITH BROWN	55 PURPLE WITH BROWN	63 BLACK WITH PURPLE
8 BLUE WITH BLACK	16 WHITE WITH BLACK	24 GREEN WITH BLACK	32 YELLOW WITH BLACK	40 BROWN WITH BLACK	48 RED WITH BLACK	56 PURPLE WITH BLACK	64 BLACK WITH BROWN

EVERY 250 MILES
1. Engine sump } Top up
2. Radiator }

EVERY 500 MILES
3. Handbrake cable (1 nipple) }
4. Handbrake compensator (2 nipples) }
5. Clutch shaft bearings (2 nipples) } Grease gun
6. Water pump bearing }
7. Front hubs (2 nipples) }
8. Rear hubs (2 nipples) }
9. Ignition distributor: Oil shaft bearing auto advance and contact breaker }
10. Handbrake lever }
11. Carburettor dashpots and control linkages } Oil can
12. Door locks, hinges, bonnet safety catch, boot and spare wheel locks }

13. Gearbox }
14. Rear axle } Top up
15. Steering box }
16. Propeller shaft splines (1 nipple) } Oil
17. Propeller shaft U.Js (2 nipples) } gun
18. Road springs—spray with oil
19. Air cleaners—oil if necessary
20. Hydraulic reservoir, clutch and brake—Top up

EVERY 1,000 MILES
21. King pin swivels (4) } Grease
22. Steerage tie rod ball joints (4) } gun
23. Steering drop arm pivot } Grease
24. Lower wishbone outer bushes (4) } gun

25. Gearbox }
26. Rear axle } Top up
27. Engine }

EVERY 2,500 MILES
28. Engine—drain oil and refill

EVERY 10,000 MILES
29. Gearbox } Drain and refill
30. Rear Axle }
31. Dynamo—oil can
32. Oil filter—renew cartridge

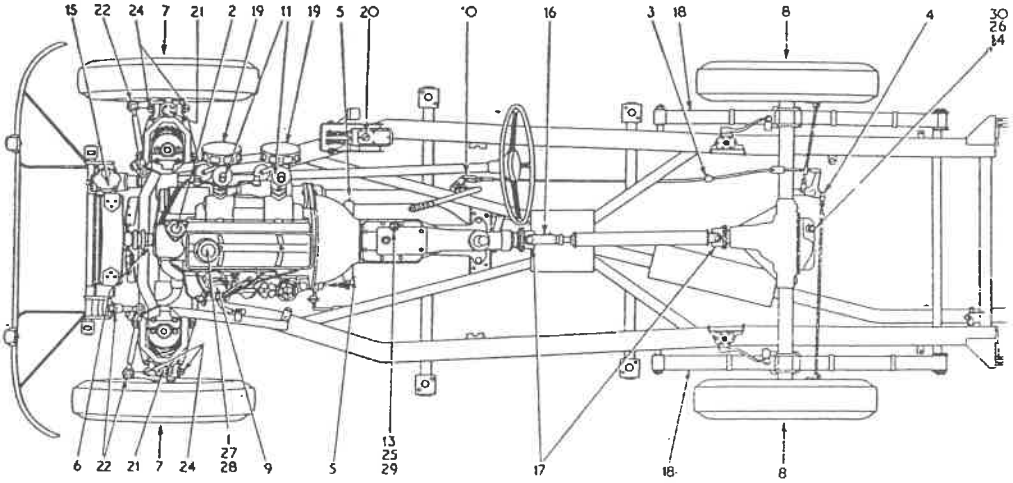
FILL-UP DATA

	Pints	Litres
Engine sump	From dry 11	6·25
	Drain to refill 10	5·7
Gearbox	1½*	·85
Rear axle	1½	·85
Cooling system ..	13, 14 with heater	7·38
Fuel tank	12½ gall.	57
Tyre pressures: front	+22lb sq in	1·55 kg cm²
rear	+24lb sq in	1·69 kg cm²

*pt with overdrive. Drain and refill 2½ pts.
"Road Speed" tyres +8 lb sq in.
High speed touring +6 lb sq in.

ADDITIONAL ELECTRICAL DATA
Lucas Equipment

	Model	Service No.
Headlamps:		
Norway & Sweden F700/ 51536 R.H.D.	F700	51546
Canada & U.S.A. F700 51509 L.H.D.	F700	51337
Switzerland F700 51535		
Export Europe	F700	51339
Export France	F700 EF	51341
Side lamps and front flashers	488	52240
Tail lamps: reflex reflectors and rear flashers..	549	53330
Number plate and stop lamp	525	53224
Starter push switch ..	SS9	31253
Lighting switch	PPG 1	31444
Dip switch	FS 22/1	31284
Ignition switch	S45	31449
Panel light switch ..	PS7/2	31419
Reverse lamp switch (gearbox fitment.. ..	SS 10/1	31077
Screenwiper switch ..	PS 7/2	31419
Stop lamp switch	HL 2	31082
Flasher unit	FL 3	35003
Ammeter	BM4	36174
Screenwiper	CRT 15	75150
Fuse box (1-35a, 1-50a) ..	SF 6	033240
Starter solenoid	ST 950	76411
Horns: high note	WT 614 HN	69012
low note	WT 614 LN	69011



inside) support car on jack, jack up separately under spring plate, take out three bolts to each lower link arm and undo nut and locknut at top of shock absorber. Lower carefully until spring is fully extended. For this operation engine must be in place to hold car down against spring.

To dismantle suspension assembly; remove spring and shock absorber, disconnect brake fluid pipe, and track rod from steering arm. Undo nut inside upper link, holding upper ball joint to two halves of upper link. Detach lower link inner pivot brackets from chassis and remove vertical link and lower link assembly.

When reassembling the vertical link in lower swivel housing, screw in until rubber seal is just nipped, and back off until full movement is available.

Tighten inner pivot bearing nuts (upper and lower) when weight of car is on springs. Tighten lower inner pivot brackets to chassis last.

Hubs run on taper roller bearings. Adjust by tightening castellated nut fully against D-washer and unscrewed one flat. Felt oil seals in retainers pressed into hubs outside inner bearings.

Three-piece track rod has sealed ball joints. Sockets on outer sections integral with rods. Sockets on centre section screwed left- and right-hand for track adjustment, and locked by nuts.

Steering gear

Bishop, cam and lever. Column adjustment provided by shims at top of inner tube. Rocker shaft movement controlled by screw and locknut.

Shock absorbers

Front, Armstrong telescopic mounted inside coil springs of suspension, double acting piston type at rear. Front units require no maintenance, rear units topped up according to service instructions.

Body details

Access to wiring of dash panel achieved by removing instruments separately.

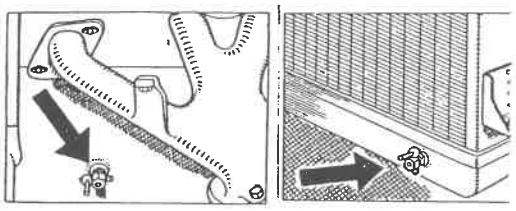
BULBS

	Lucas No.	Voltage	Wattage	Cap
Headlamps: dip left	354	12	42/36	Prefocus
Norway & Sweden ..	350	12	35/35	Prefocus
dip right ..	355	12	42/36	Prefocus
Canada & U.S.A.	301	12	36/36	Prefocus
vertical dip ..	370	12	45/40	Prefocus
Switzerland ..	370	12	45/40	Prefocus
Side lamps and flasher	380	12	21/6	SBC
Tail lamps and flasher	380	12	21/6	SBC
Number plate and stop lamp ..	380	12	21/6	SBC
Ignition warning lamp	987	12	2·2	MES
Beam and flasher warning lamps	987	12	2·2	MES

BALL AND ROLLER BEARING DATA

	Part No.	Int. dia., Ext. dia., Width (in or mm)
Gearbox mainshaft centre and primary shaft	58391	$3\frac{1}{8} \times 1\frac{1}{2} \times \frac{7}{8}$in
Gearbox mainshaft rear	SP 75 G	30×62×16mm
Rear axle pinion bearings: rear	100897	$1\frac{1}{4} \times 2\frac{3}{16} \times 1\frac{3}{16}$in
rear	100422	$2\frac{7}{16} \times 1 \times \frac{3}{16}$in
*Rear axle diff. bearings:	110515 / 100899	$1\frac{1}{2} \times 2\frac{7}{16} \times \frac{15}{16}$in
Rear hub bearing ..	SP 75 G	30×61×16mm
Front hub outer	100536	$1\frac{3}{8} \times \frac{1}{2} \times$??in
Front hub inner	100573	2×1×??in
Clutch release	501608	

*New type from chassis No.: TS.3022.



DRAINING POINTS
Left: Cylinder block drain tap at rear on offside beneath manifold. Right: Radiator drain tap on bottom tank on offside. Note: System is pressurised.

TUNE-UP DATA

Firing order	1, 3, 4, 2
*Tappet clearance (cold): inlet	0·10in
exhaust	0·12in
Compression pressure ..	120lb sq in
Valve timing: inlet opens ..	15° BTDC†
inlet closes ..	55° ABDC†
exhaust opens	55· BBDC†
exhaust closes	15° ATDC†
Standard ignition timing ..	4° BTDC
Location of timing mark ..	Flywheel and pointer
Distributor: type and service No.	DM 2 P4 40403
Advance range (crank. deg.): centrif.	26°-30°
vacuum	12°-16°
Advance starts (crank rpm)	200-400
Max. advance (crank rpm)	4,300
Cam angle	60°±3°
Contact spring tension ..	18-24 oz
Contact set No.	·420196
Contact breaker gap ..	·014-·016in
Condenser: capacity ..	·2 mf
min. insulation	3 megohms
Plugs: make	Champion
type	L 10 S or L 11 S
size	14mm
gap	·032in

*For high speed road work set inlet and exhaust to ·013in.
†At ·015 tappet clearance

Carburettor: make	S.U.
type	Semi dd. H4
Settings: Choke	Fixed
Standard needle	F.V.
High speed needle	G.C.
Air cleaners: make	AC
type	Oil wet
Fuel pump: make	AC
type	Mech.
pressure ..	1½-21