

SINCERE'S

MINI-BIKE

SERVICE BOOK



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Chapter Three

How to Assemble a Mini-Bike

All material used in this chapter is courtesy of The Heathkit Company of Benton Harbor, Michigan. The model number is the GT-18 Trail Bike.

The steps and procedures herein are very basic and could apply to most units, sub-assemblies, or replacement situations. Excluded would be the special innovations and creations by individual manufacturers.

Figure 44

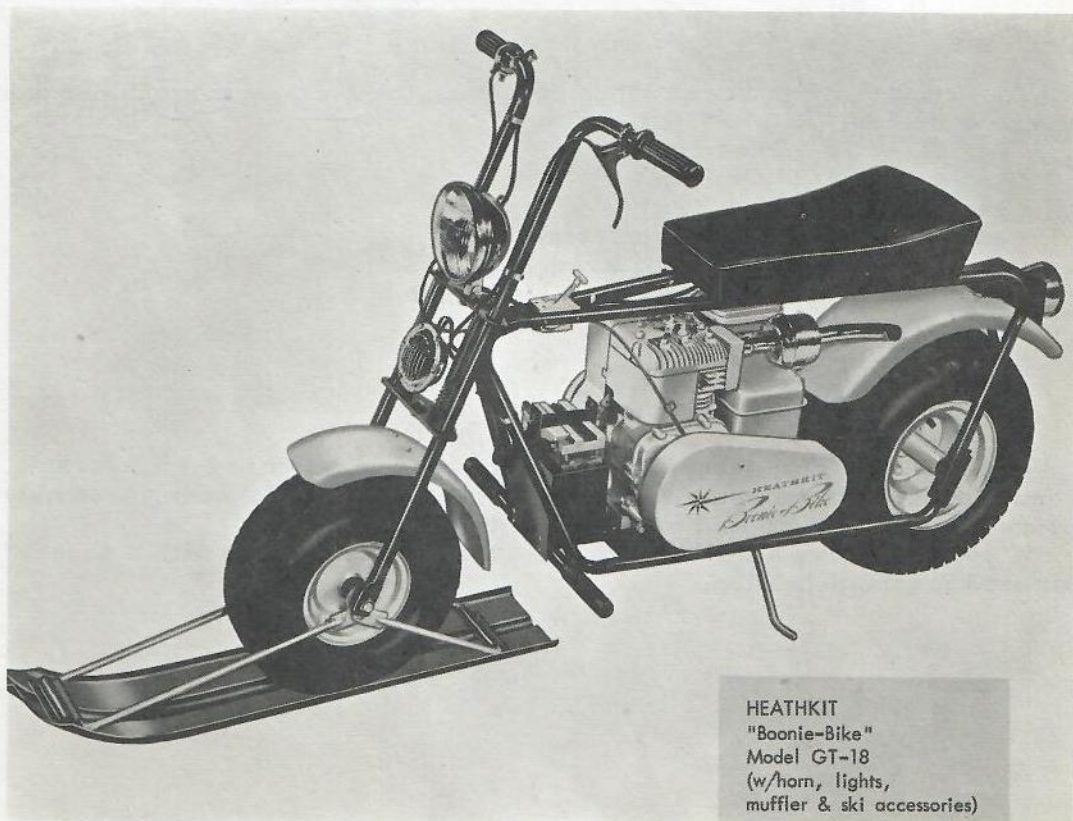
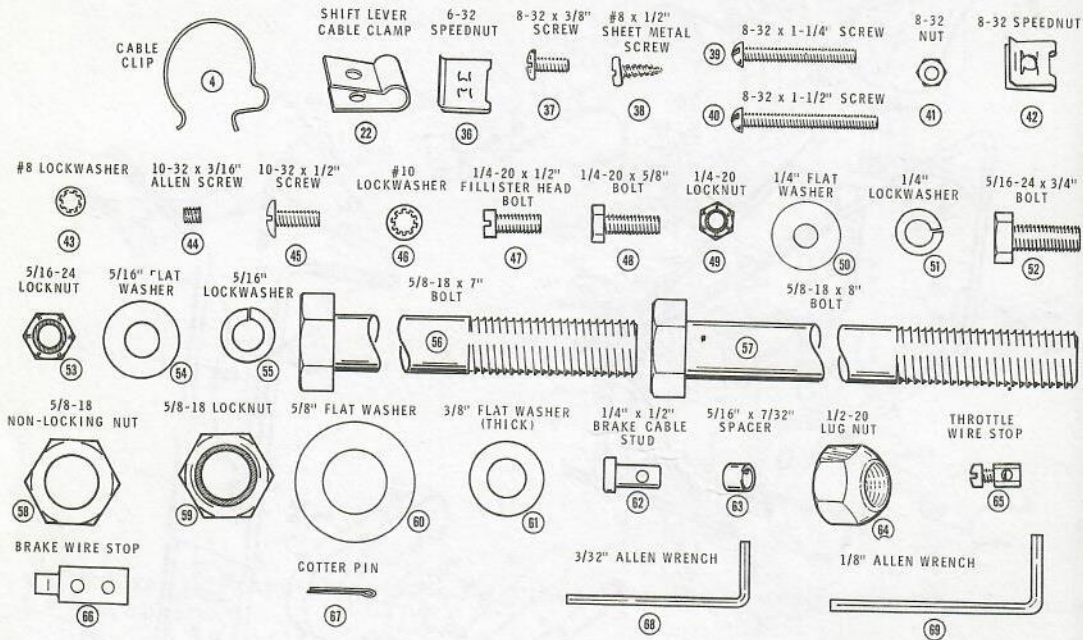


Figure 46

Screws-nuts etc for erection



Place an old rug, or bedspread, over the working area to prevent damage to the paint job.

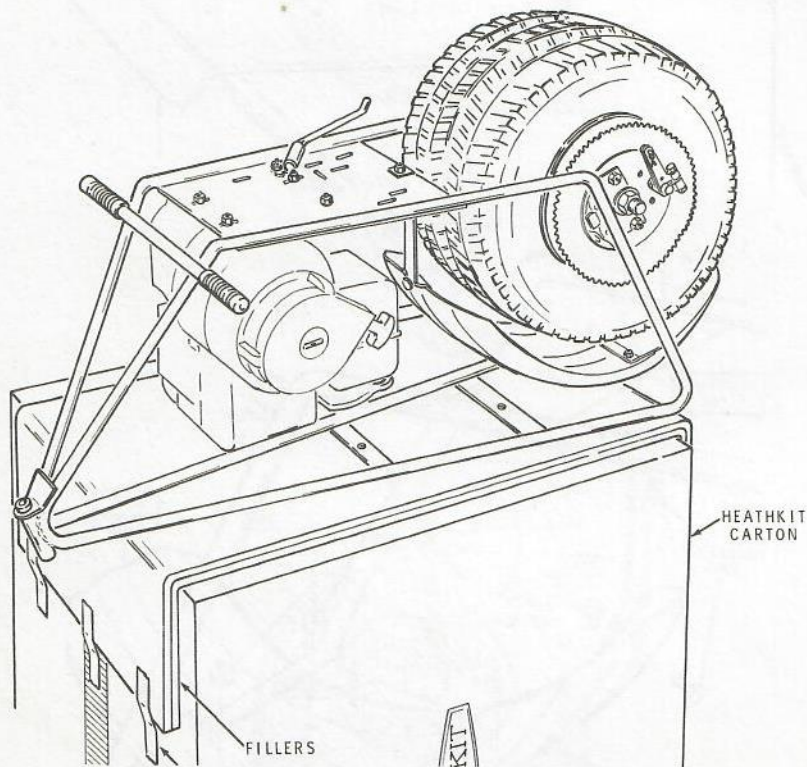
When your bike arrives the motor will probably be attached. If not, put motor in place on the frame.

1. Place motor in position until holes align with frame holes.
2. Place bolts in proper holes and screw only locknuts in place.

After motor is mounted, turn frame over on work area. See figure 47.

1. Allow the frame to extend over work area edge.
2. Place gas tank shield near the gas tank.
3. Place large hole in shield behind hook in gas tank. Figure 48.
4. Mount the shield to gas tank. Use 10 x 1/2" screw with a #10 lock-washer at each mounting hole.

Figure 47



Mounting the rear fender.

1. Place rear fender bracket at the corresponding spot on frame.
2. Mount front of fender, per figure 49, below. Finger tighten only.
3. Mount rear of fender over adjacent holes and insert 1/4"-20 x 5/8" bolts in each hole, with 1/4"-20 locknut. Finger tighten only.
4. After all bolts are in place and fender is straight, tighten securely.

Figure 48

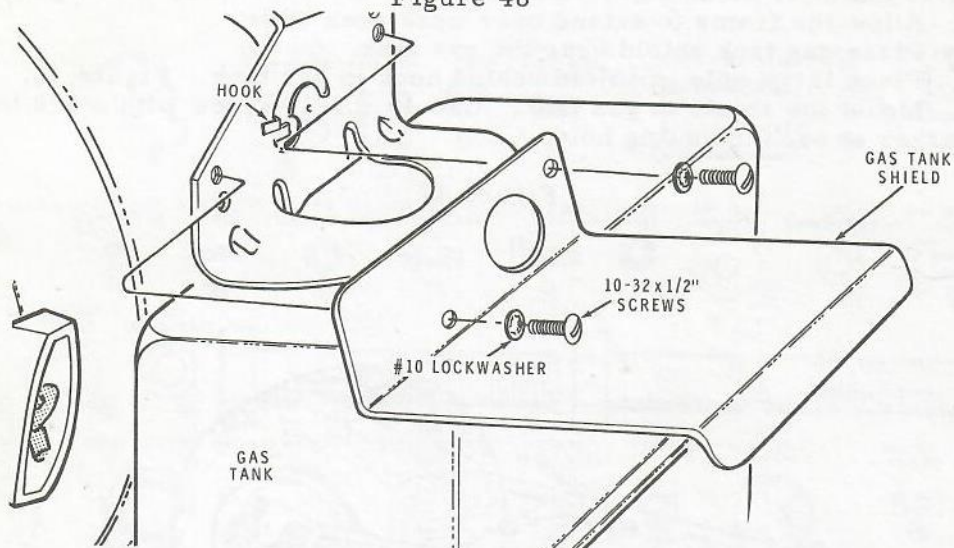
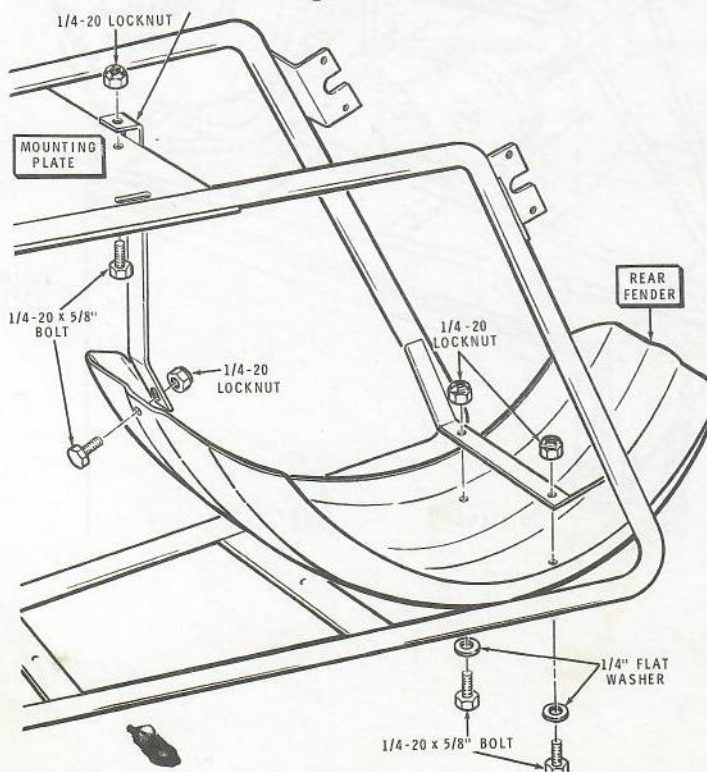


Figure 49



Mounting the Rear Wheel.

1. Refer to figure 50, and mount the rear axle housing to rear wheel. Use four 1/2"-20 lug nuts. Rear axle housing must be inserted through the wheel from side opposite the tire valve. The flange on the rear axle housing should be centered in the center hole of wheel assembly. Lug nuts fit in place with taper matching holes in the wheel.
2. Turn wheel assembly over and mount the brake drum to rear axle housing. Use three 5/16" lockwashers and 5/16"-24 x 3/4" bolts, per figure 51, below.

Figure 50

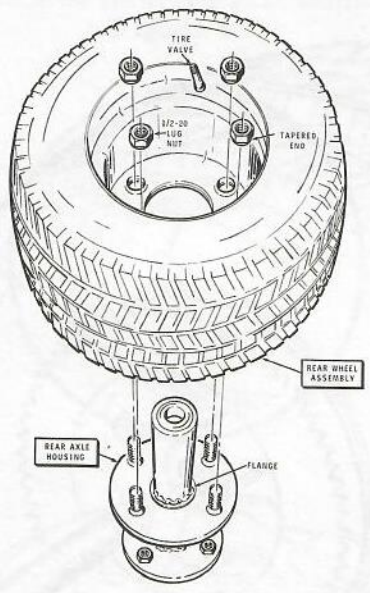
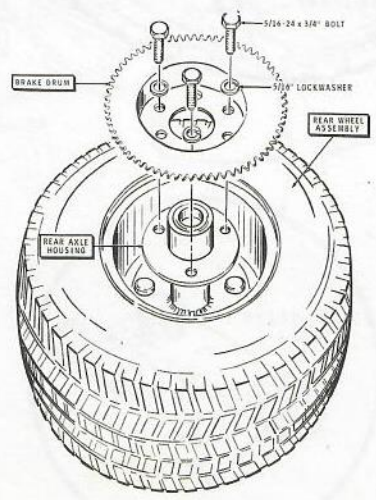


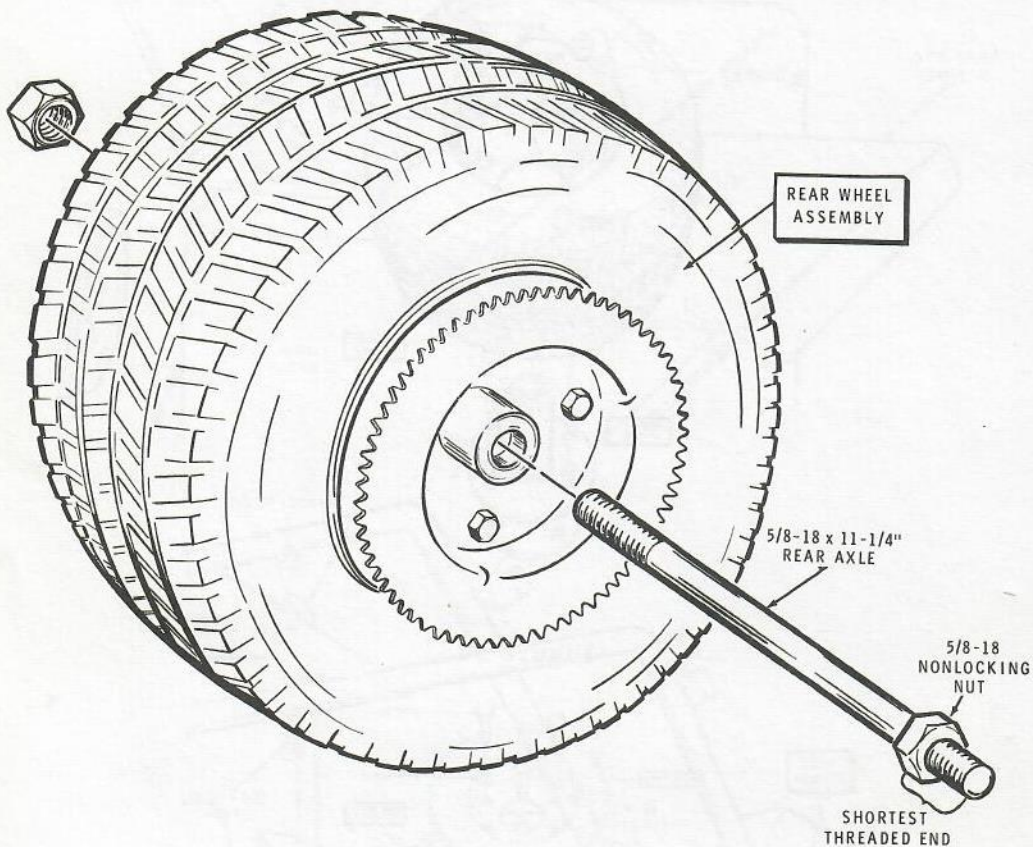
Figure 51



Installation of Rear Axle.

1. Install a 5/8"-18 non-locking nut on one end of axle with shortest threaded area. Turn the nut completely on.
2. Install rear axle in rear axle housing and lock in place with a 5/8"-18, non-locking nut. The end of axle with nut already in place should be on the brake drum side of the axle housing. Adjust second nut until both are snug against bearings in the axle housing. Test wheel to be sure it turns freely, with little or no end play in the axle housing.

Figure 52

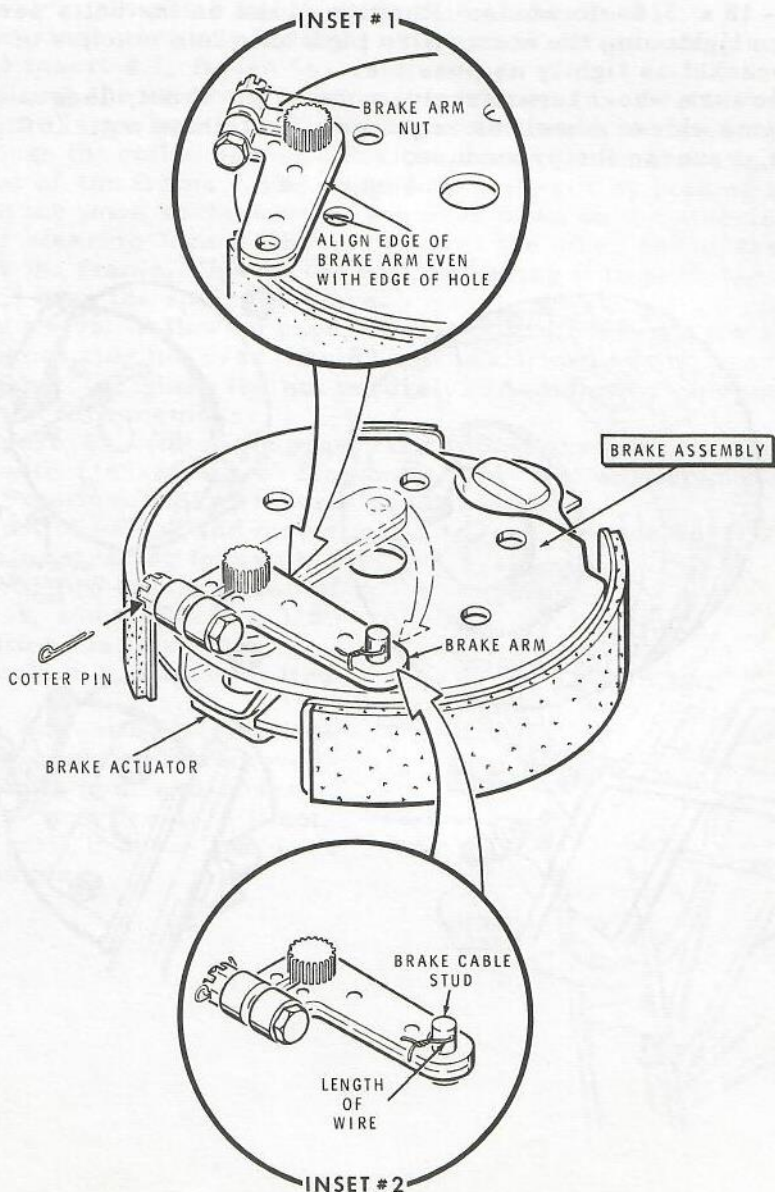


Installing the Brake Assembly.

Refer to figure 53, below.

1. Loosen the brake arm nut, remove and turn the brake arm until the top edge is even with edge of hole illustrated in Inset # 1.
2. Move brake arm onto the brake assembly by pushing brake arm and brake actuator toward each other.
3. Tighten nut on the brake arm slightly, to allow cotter pin to be put into small hole on the bolt.
 - a. Don't overtighten or brake arm may be broken.
4. Install cotter pin and bend so it won't fall out.
5. Install brake cable stud in brake arm temporarily. See inset # 2.

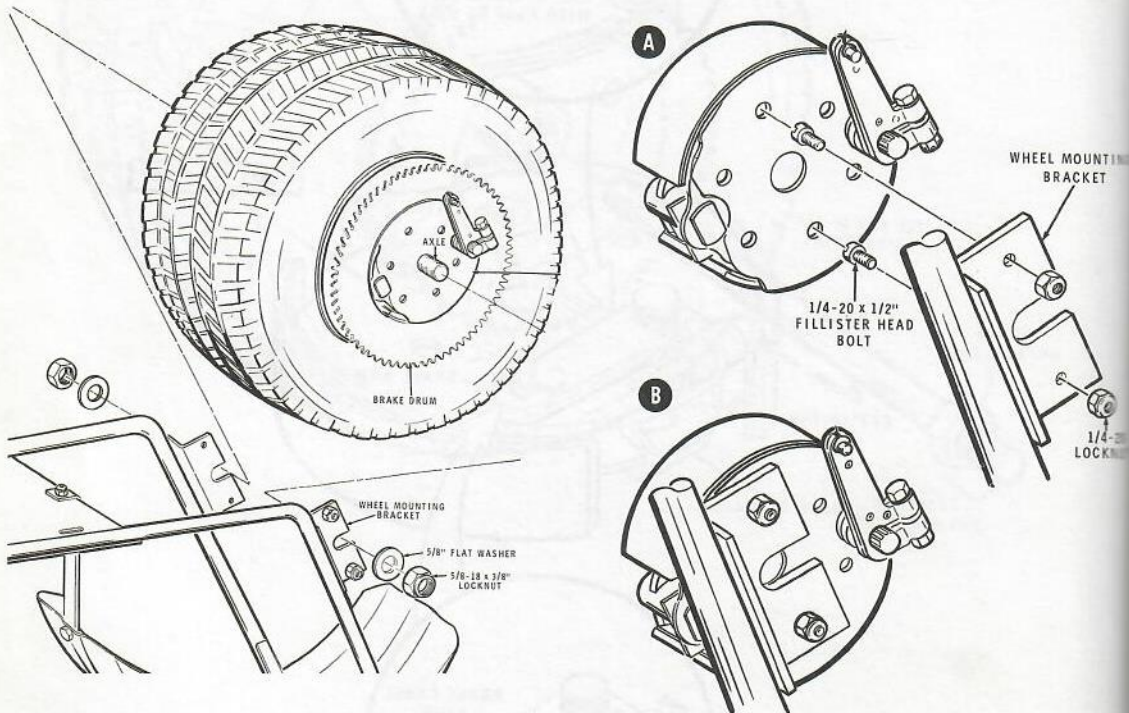
Figure 53



Final Installation of Rear Wheel Assembly.

1. Install 1/4"-20 x 1/2" fillister head bolts in the two indicated holes in wheel mounting bracket, with 1/4"-20 locknuts. Before tightening the nuts, temporarily place two of the holes in the brake assembly over the bolts to obtain proper alignment of the bolts. See Inset, figure 54.
2. Tighten the bolts.
3. Place brake assembly over the axle and onto the brake drum.
4. Before installing the rear wheel assembly to the frame it's necessary to position the bolts on wheel mounting bracket into indicated holes of the brake assembly. When this is accomplished, swing the wheel assembly in, until the axle fits into the slot in the other wheel mounting bracket. If necessary, spread the frame slightly so axle will fit in the slot.
5. Mount wheel assembly in the frame with two 5/8" flat washers and 5/8"-18 x 3/8" locknuts. Position brake on the bolts per illustration, before tightening the nuts. Also push axle into notches of wheel mounting bracket as tightly as possible.
6. Be sure wheel turns freely on the axle. If not, loosen outside nut on the same side of wheel, as required. Re-tighten nut. If the wheel is too loose, reverse the procedure.

Figure 54



Front Wheel.

Components required for front wheel assembly.

1. 1 ea. Steering fork.
2. 1 ea. Front fender.
3. 1 ea. Front wheel assembly.
4. 1 ea. Coil spring.
5. 2 ea. Bronze bushings, size 5/8" x 1".
6. Assorted bolts, 1/4"-20, 5/8"-18", flat washers, and lock nuts.

When inserting the bronze bushings in the front frame tube, use the 5/8 - 18 x 8" bolt to set bearings in place with damage to them.

1. Place bearings adjacent to the tube.
2. Insert bolt in bearing with head pointing up.
3. Tap bearing into place lightly, use a small hammer.
4. Keep bearings perfectly straight as they are driven into place.
 - a. See insert # 1, figure 56.

When installing the steering fork on the frame, insert a screwdriver blade through the large hole in the lubricated member of the steering fork, and down through the coiled spring. Position screwdriver blade in the tubing at the front of the frame. Have someone help you by holding the bike frame down on the work surface while you push down on the steering fork, until the other steering fork member fits over the other end of the tubing at the front of the frame. Insert the bolt, allowing it to push the screwdriver out, and keep the spring in place.

Refer to figure 56, following page, Insert # 2, and mount the steering fork on the frame using the 5/8"-18 x 8" bolt in the coil spring, and a 5/8"-18 x 3/8" locknut. Tighten the nut securely. Avoid overtightening since it might bend the fork members.

Refer to figure 58, following page, and mount the front fender on the steering fork with 1/4"-20 x 5/8" long bolts, 1/4" flat washers, and 1/4"-20 locknuts. Position fender properly per drawing.

Refer to figure 55 below, and mount front wheel on the steering fork with a 5/8-18 x 7" bolt, two spacers, two of the flat washers, and a 5/8-18 x 3/8" locknut. Position the tire valve.

Figure 55

1. Insert axle bolt from indicated side.
2. Tighten nut until all side -to-side play is completely removed.
3. Spin front wheel and observe
4. It should turn freely. If not, loosen nut until it does, but don't allow an end play.

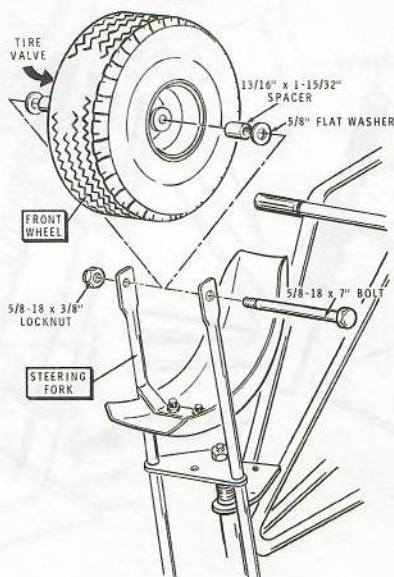


Figure 56

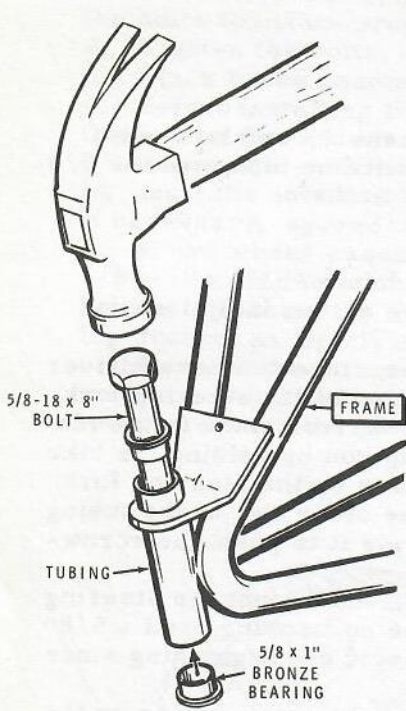


Figure 57

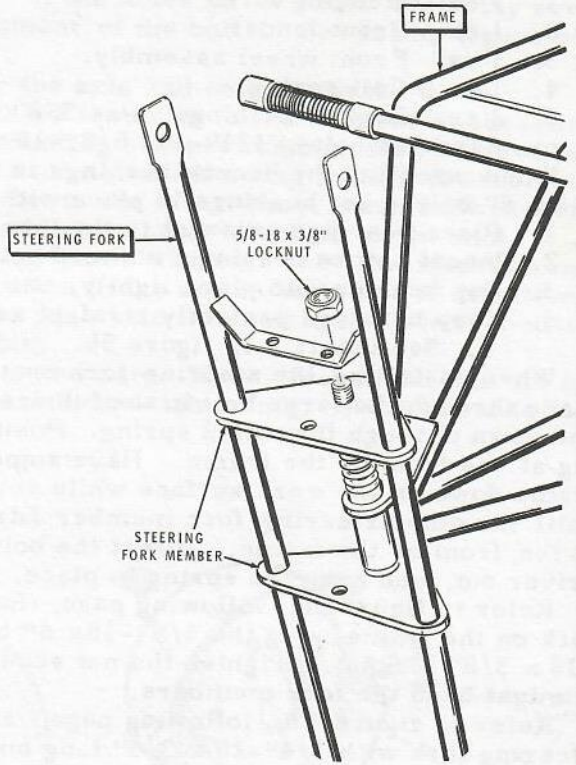
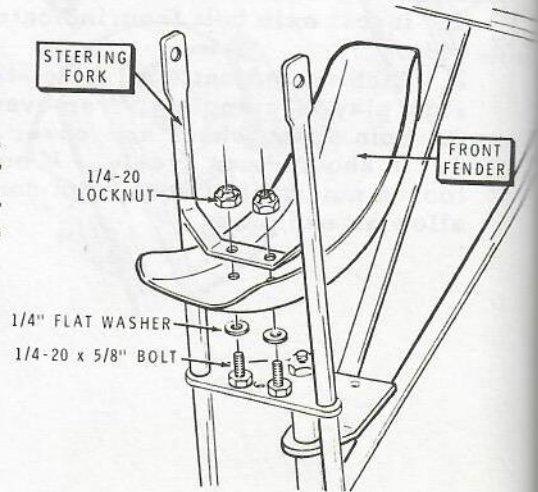
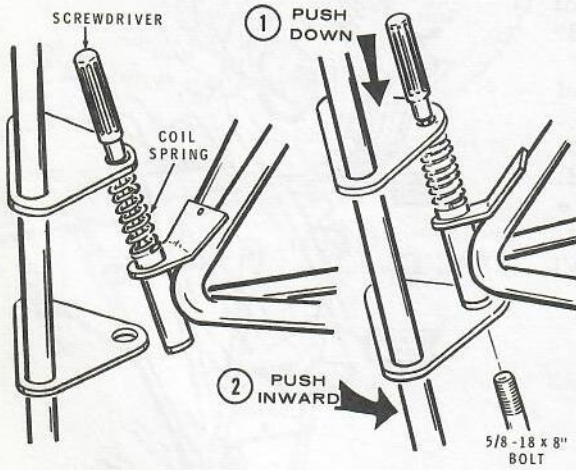


Figure 58



The Transmission.

Refer to figure 59 below for installation procedure.

Components for transmission installation.

1. 1 ea. Two speed transmission.
2. 1 ea. Transmission bracket.
3. 1 ea. Shift lever cable bracket.
4. 2 ea. Bearings, flange-type, 5/8" ID- 1 3/8" OD.
5. 1 ea. Chain, 41 1/4" lg.
6. 1 ea. Chain connecting link.
7. Assorted 5/16-24 bolts, 8-32 screws, and washers with nuts.

Refer to figure 60 below, and mount shift lever cable bracket on mounting plate of the frame. Position the bracket completely forward.

Figure 59

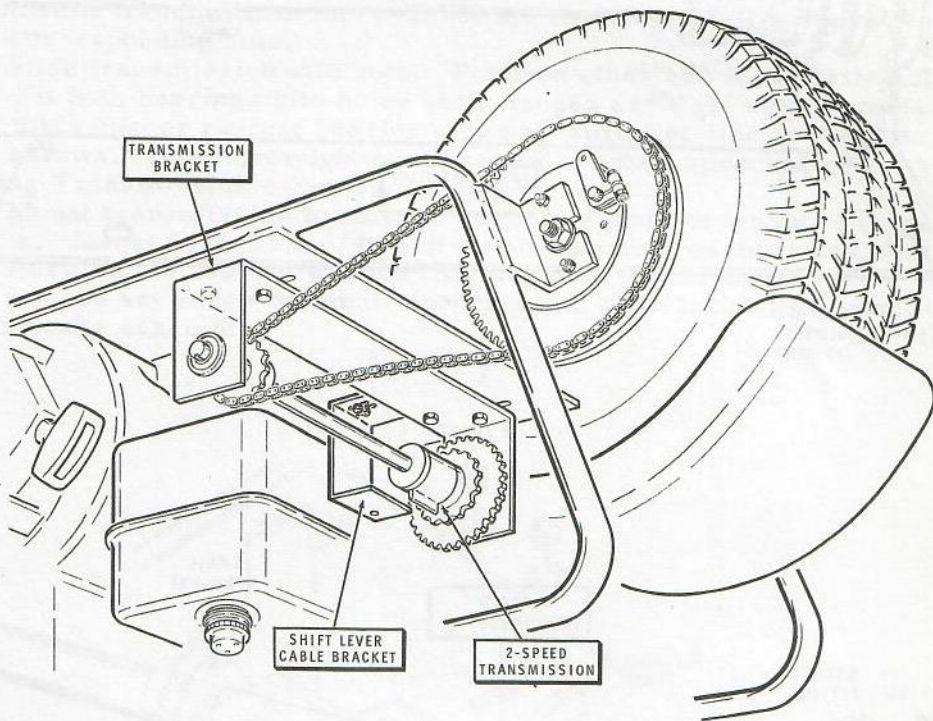
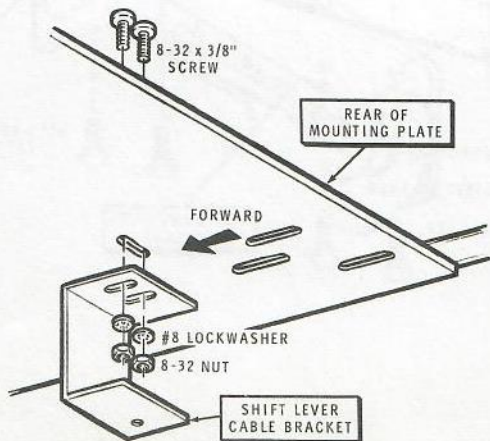


Figure 60



Lubrication of transmission and related components.

1. Grease the transmission at points referred to in figure 61.
2. Add oil at point noted in figure 61.

Figure 61

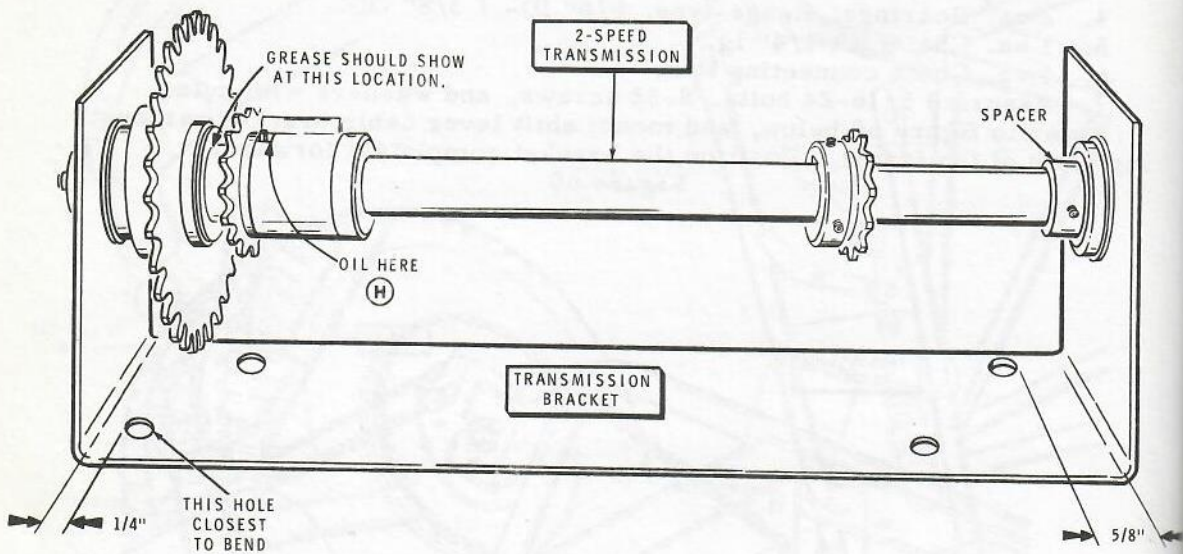
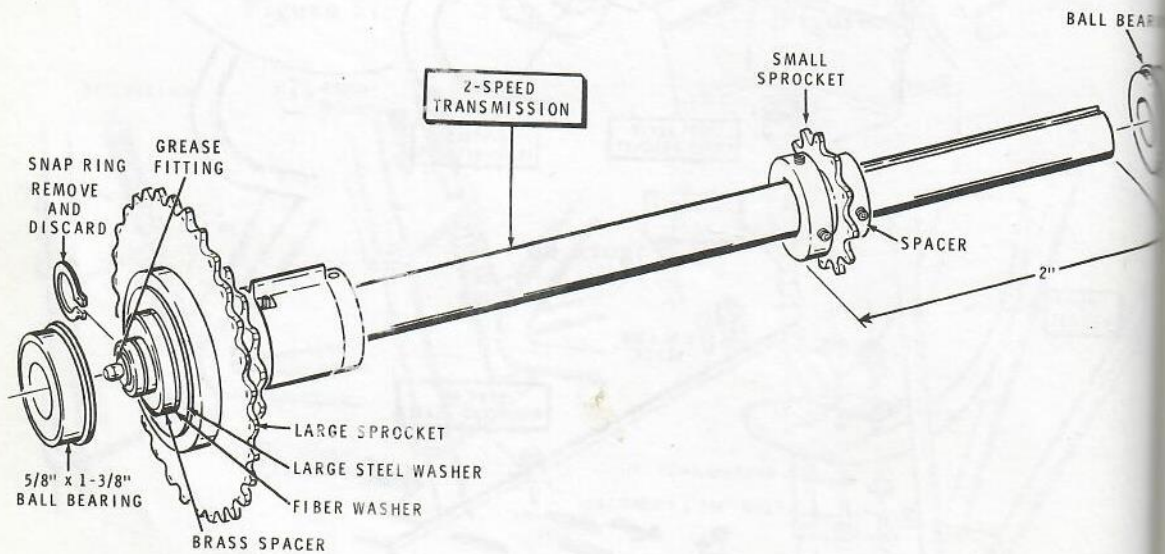


Figure 62



Assembly of Transmission

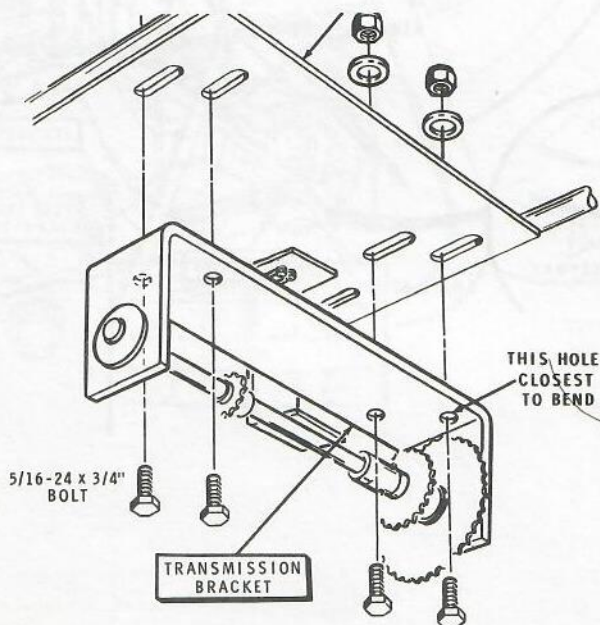
Refer to previous page and follow drawings.

1. Use a snap ring tool, or pair of needle nose pliers, and remove the snap ring from grease fitting end of transmission.
2. Discard the ring.
3. Hold the brass spacer, fiber washer, large steel washer, and large sprocket so they don't fall off the transmission.
4. Tap the bearings into place. Put one on grease fitting end in place first, with flange of bearing pointing inward, per drawing.
5. Loosen set screws in the small sprocket and spacer at other end.
6. Install ball bearings on other end, with flange pointing inward.
7. Move inward about 2" from end of the shaft.
 - a. Slide small sprocket against bearing and tighten set screw.
8. Install transmission into bracket by inserting small sprocket end in the corresponding hole.
9. Slide transmission into hole. Position other end in opposite hole.
10. Fit both bearings into holes until flanges are tight against metal.
11. Slide spacer against bearing on small sprocket side and tighten the set screws. Don't overtighten set screw in small sprocket yet.

Mounting Transmission assembly to the Frame.

1. Mount transmission bracket on mounting plate of frame. Figure 63.
 - a. Insert 5/16-24 x 3/4" bolts with matching washers and nuts.
2. Position the bracket but don't tighten nuts at this time.
3. Loosen set screw on small sprocket and align with brake drum at the rear brake assembly.

Figure 63



4. Stretch a string line, or a straight edge to determine chain alignment. Mis-alignment will damage, or wear chain and sprocket.
5. Turn small sprocket until key is aligned with keyway. Tighten set screws and double check the alignment.

Installing the Chain.

1. Refer to figure 65, following page.
2. Install the long chain around brake drum and small sprocket.
3. Locate a chain connecting link and if necessary, remove locking clip and the outside strap.
4. Install chain connecting link between ends of the chain.
5. Move transmission as far forward as possible. This should allow the proper chain tension of no more than 1/4" slack at center point. When bracket is parallel to rear edge of mounting plate, tighten bolts.
6. Loosen mounting hardware of the shift lever cable bracket.
7. Push the bracket back until rear bottom edge is flush against front edge of transmission bracket(per arrow in drawing).
8. Re-tighten the shift lever cable bracket hardware.
9. Check chain tension again in case it was changed during adjustment.

Figure 64

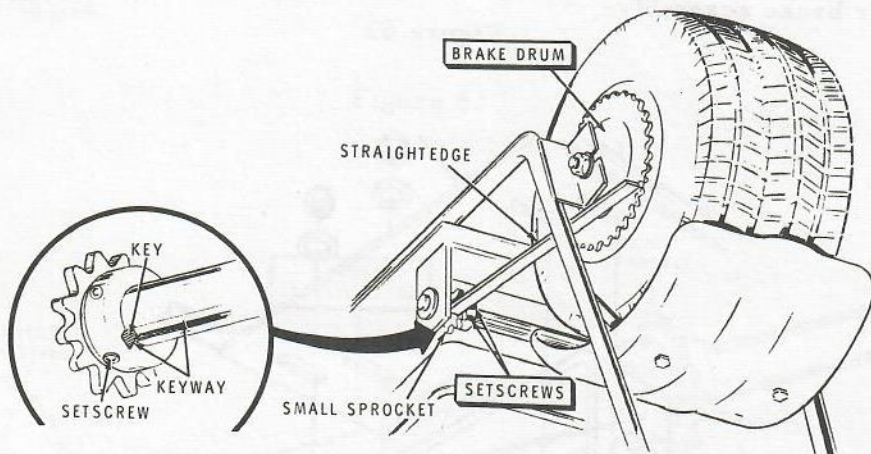
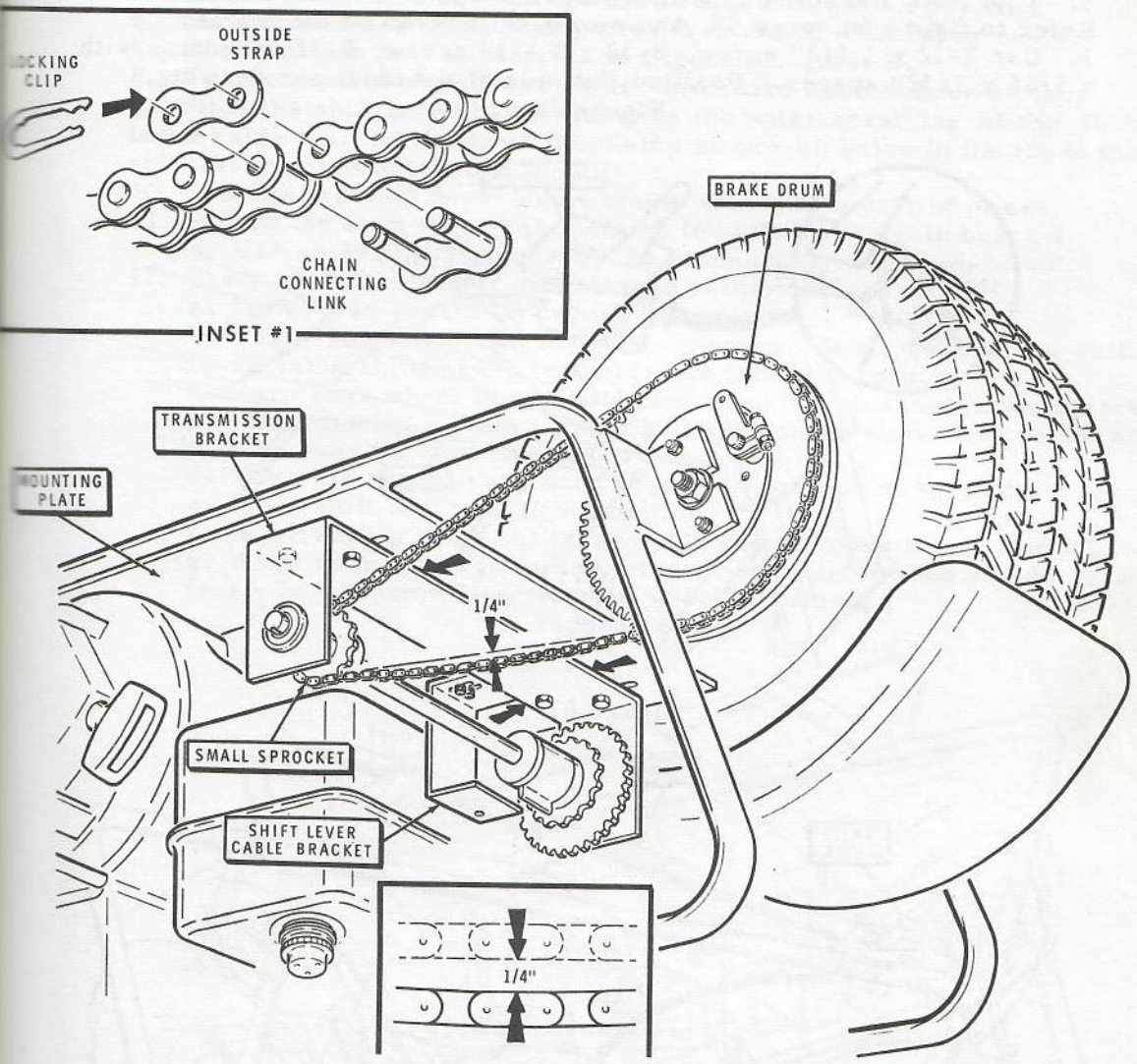


Figure 65



The Shift Lever.

To complete assembly of the shift lever, position frame and wheel assembly right side up. Lower kickstand to hold bike in place.

Locate shift components and place them near your work area.

1. 1 ea. Shift lever with cable.
2. 1 ea. Shift lever cable clamp.
3. 1 lot Nuts and screws, with washers & spacers for erection.

Refer to figure 66, page 59, and mount shift lever on the frame.

1. Use 8-32 x 1 1/2" screw, 8-32 x 1 1/4" screw, 8-32 speednuts, with a 5/16 x 7/32" spacer. Position flat side of speednut per drawing.

Figure 66

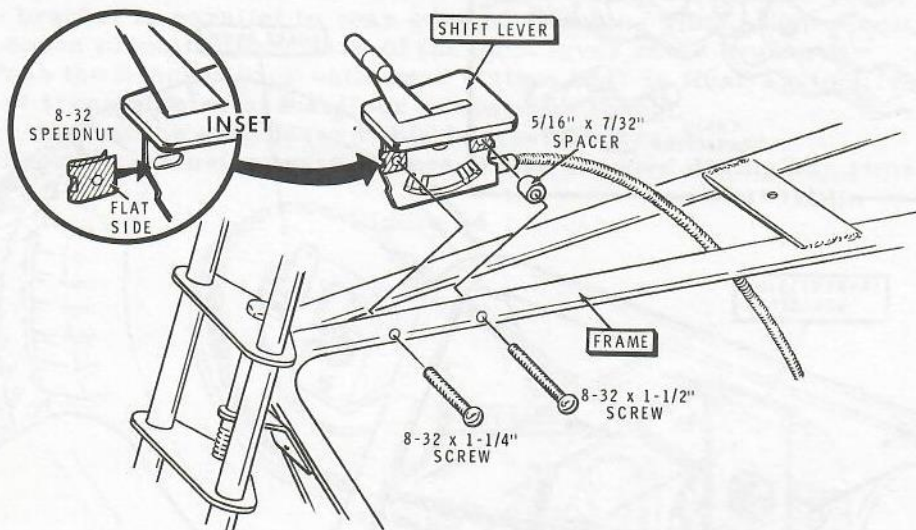
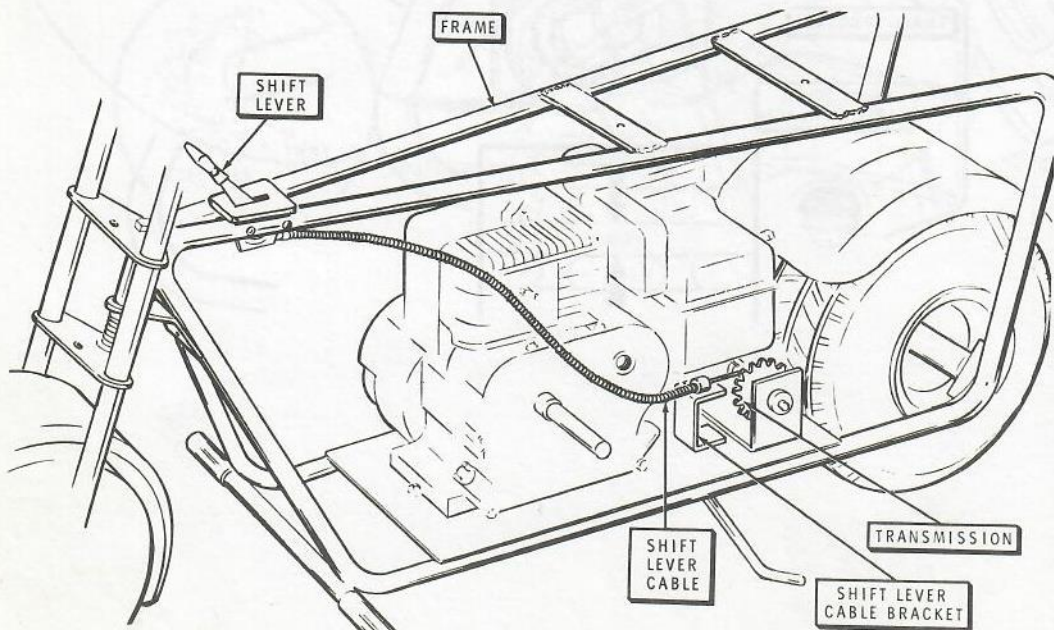


Figure 67



2. Rotate tab on the transmission until it aligns with the top rear edge of the shift lever cable bracket.
3. If necessary, bend the shift lever cable bracket until the top rear is $1/8''$ from tab on the transmission, per figure 68, Inset # 1.
4. Place the shift lever in low position.
 - a. Shift lever should be pushed forward as far as possible.
5. Rotate transmission until the tab is in a straight-up position.
6. Slide shift lever cable clamp over free end of shift lever cable.
7. Position clamp as illustrated in Figure 68, Inset B.
8. Position end of shift lever cable inner wire against base of tab.
9. Slide the shift lever cable clamp on the outer sheathing of the shift lever cable until the holes in the clamp align with holes in the top of the shift lever cable bracket.
10. Squeeze the shift lever cable clamp shut with a pair of pliers.
11. Secure the shift lever cable clamp to shift lever cable bracket.
 - a. Use an 8-32 x $3/8''$ screw, #8 lockwasher, and an 8-32 nut.
12. Check shift for proper operation of transmission.
 - a. Shift lever should be in LOW position.
 - b. Turn rear wheel in a forward direction. Inner wire of the shift lever cable should keep transmission tab from turning.
 - c. Turn rear wheel in opposite direction, which should allow the tab on transmission to turn. The inner wire of the shift lever cable can rise up over the tab, as the tab turns.
 - d. The wire should snap back to proper position at base of the tab.
 - e. Move shift lever to HIGH position.
 - f. Inner wire of the shift lever cable should move away from tab.
 - g. When rear wheel is turned either direction, the tab should turn freely in the same direction the wheel is turned.

Figure 68

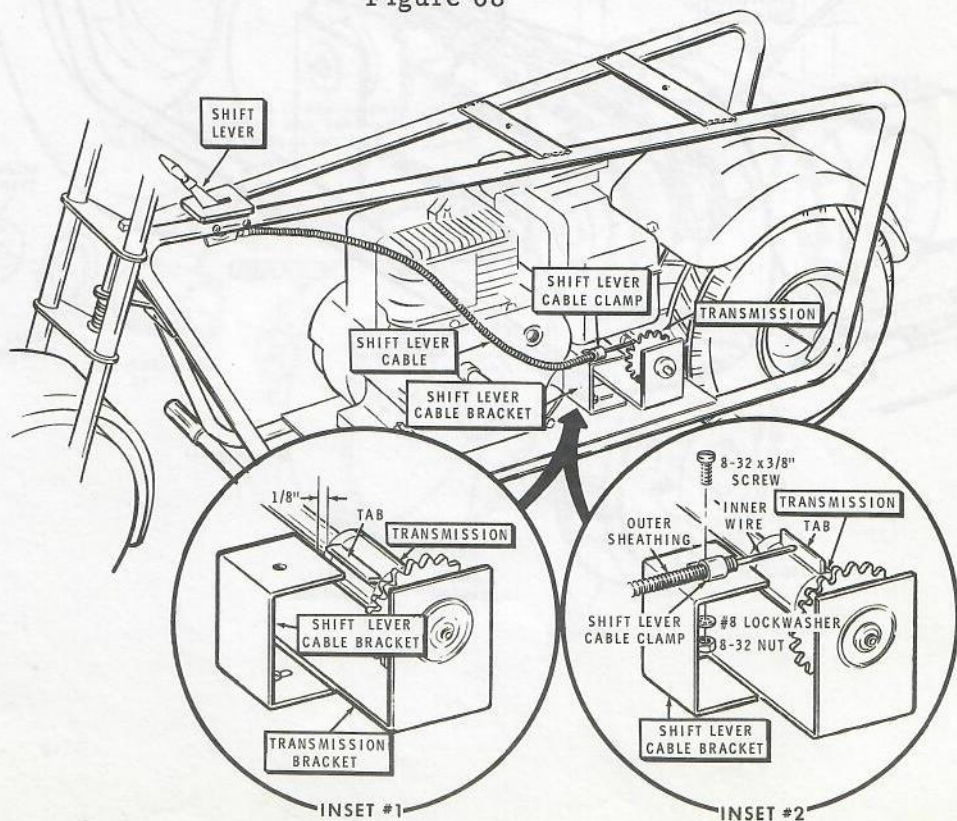
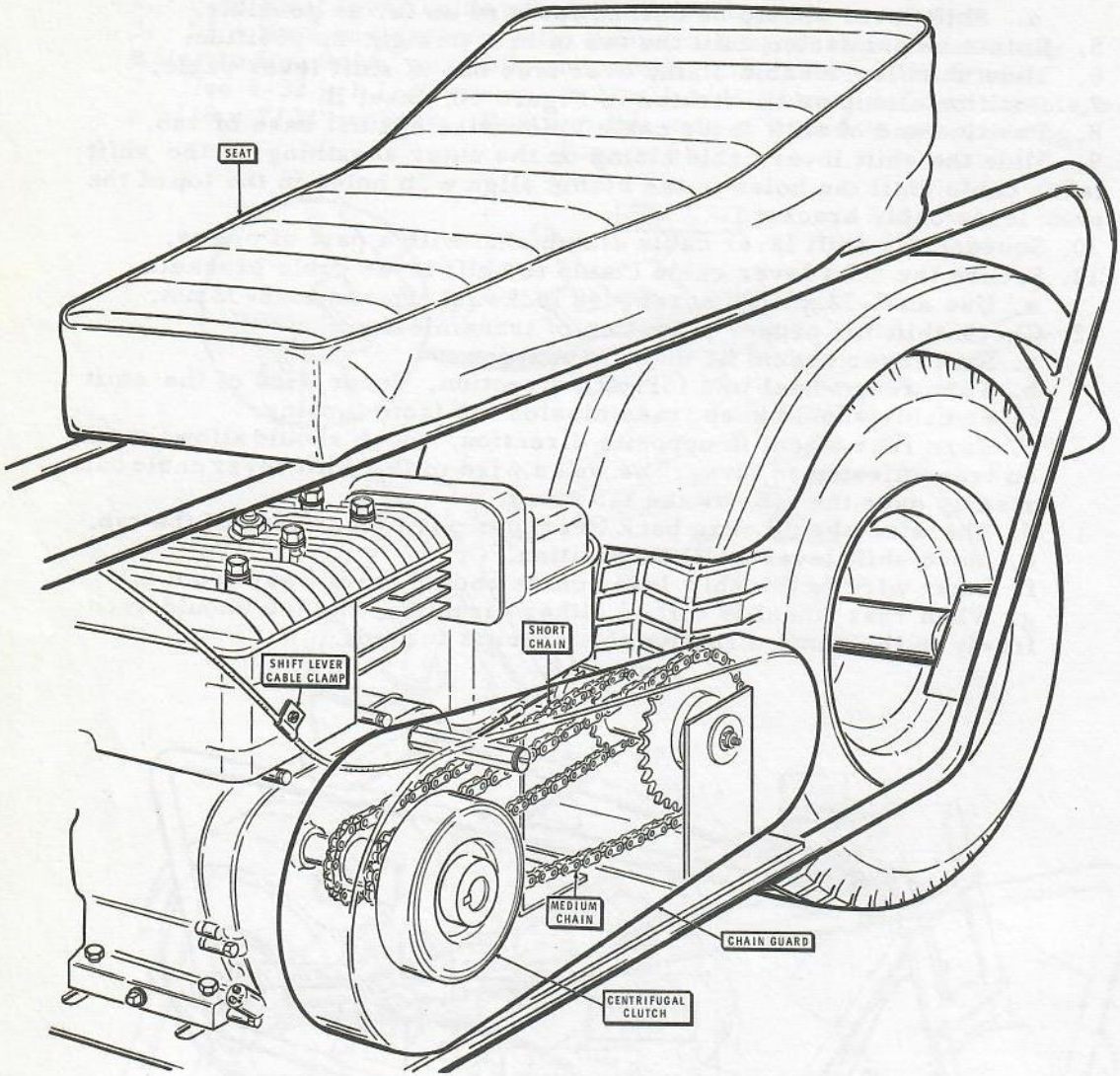


Figure 69



Centrifugal Clutch-Drive Chains:

1. Loosen but don't remove allen screws in the shoe assembly.
2. When installing the centrifugal clutch, check the key. It is slightly oversized and must be driven into keyway of the motor shaft.
3. Place one large washer on the engine shaft.
4. Place oilite bearings on shaft, with key of bearing positioned away from engine shaft, exactly as shown in figure 70.
5. Place clutch housing on engine shaft over oilite bearings.
6. Place large washer on the engine shaft.

When you install the shoe assembly in the next step, be certain that the clutch housing is free to rotate after you've tapped it a few times.

If the clutch housing doesn't rotate freely at any time before or after the shoe assembly is complete, tap lightly on clutch housing until it does.

1. Drive shoe assembly on engine shaft by tapping lightly on collar.
 - a. Stop when shaft is within 1/8" of collar edge. Inset below.
 - b. Check clutch housing frequently to be sure it remains free.
2. Tighten allen screw.

The clutch probably gets more punishment than any other part of a bike. Although the clutch contains an oilite bearing, which in theory never needs oiling, it's advisable to oil the clutch frequently. See figure 71.

Also oil the clutch shoes occasionally. Don't worry if clutch slips immediately after oiling. Shoes will absorb oil and slipping will stop.

To install short chain of transmission(21- 3/4" lg), refer to fig. 71.

1. Chain goes on inside sprockets(toward engine).
2. Install with connecting link pointing direction indicated in fig. 71.

Figure 70

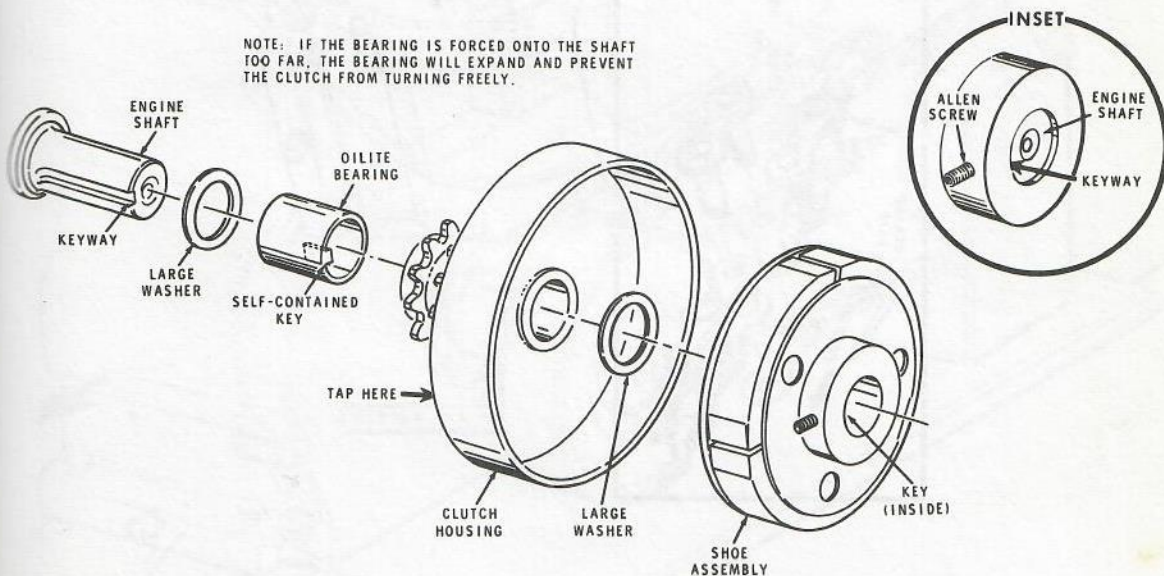
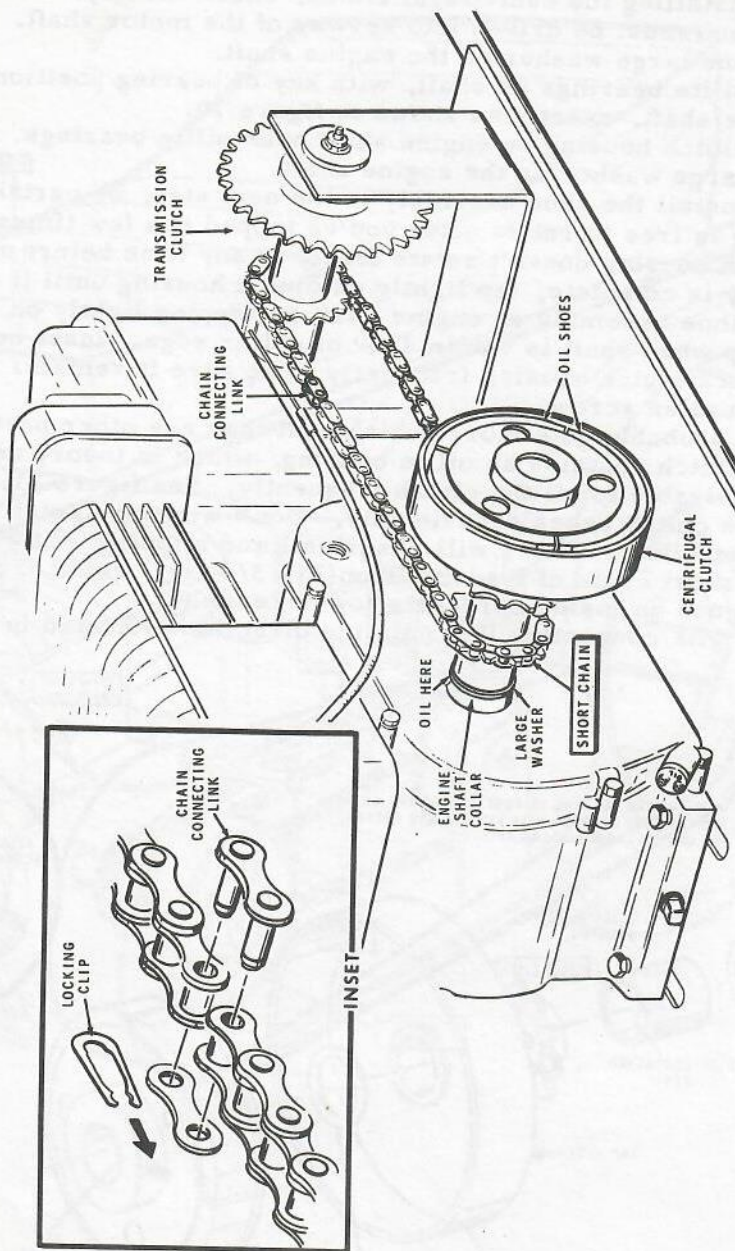
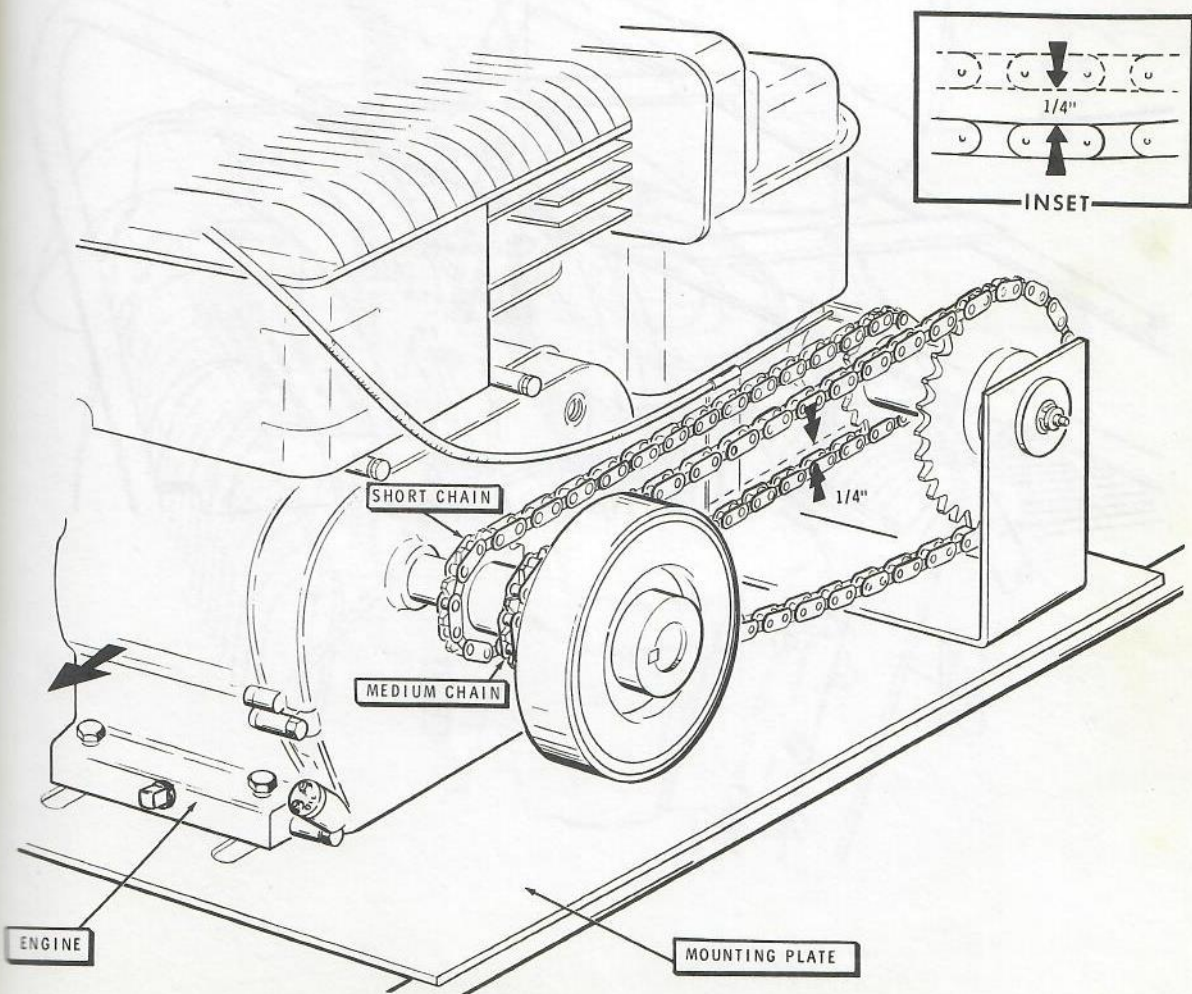


Figure 71



- To install the second chain(24-3/4" lg), refer to figure 72 below.
1. Install chain with connecting link in same position as last step.
 2. When both chains are in place, move engine to take up slack.
 3. The engine base is slightly tapered so use caution in alignment.
 4. Refer to figure 74, and adjust base accordingly.
 5. Adjust until there's about 1/4" play on the INNER chain. It's nearly impossible to obtain same tension on both chains.
 - a. Don't overtighten either chain. Too much strain on chains will cause clutch and motor to wear.
 6. Tighten screws holding motor in place.
 - a. Follow alignment procedure but don't use a bar to force chains tight.
 7. Refer to figure 74, and fasten shift lever cable to side of the engine with shift lever cable clamp. Use screw and lockwasher where noted.
 8. Install threaded and tapped spacer in indicated hole of engine.
 9. Mount chain guard with 10-32 x 1/2" screw, a # 10 lockwasher, the two 8 x 1/2" sheet metal screws, and two each 6-32 speednuts.
 - a. Position flat side of speednut as shown in figure 74.

Figure 72



To mount the seat, refer to figure 73, below.

1. Use two 1/4"-20 x 5/8" bolts with lockwashers.

Figure 73

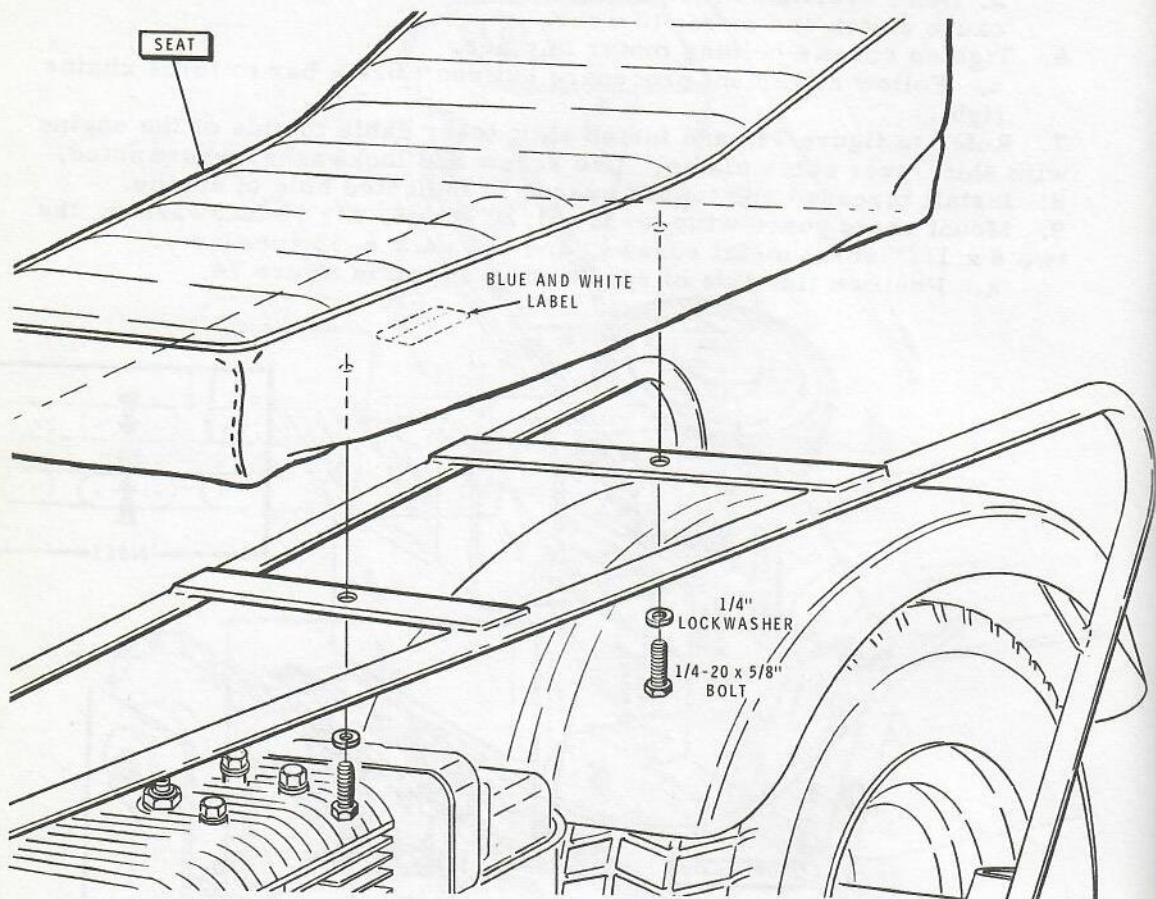
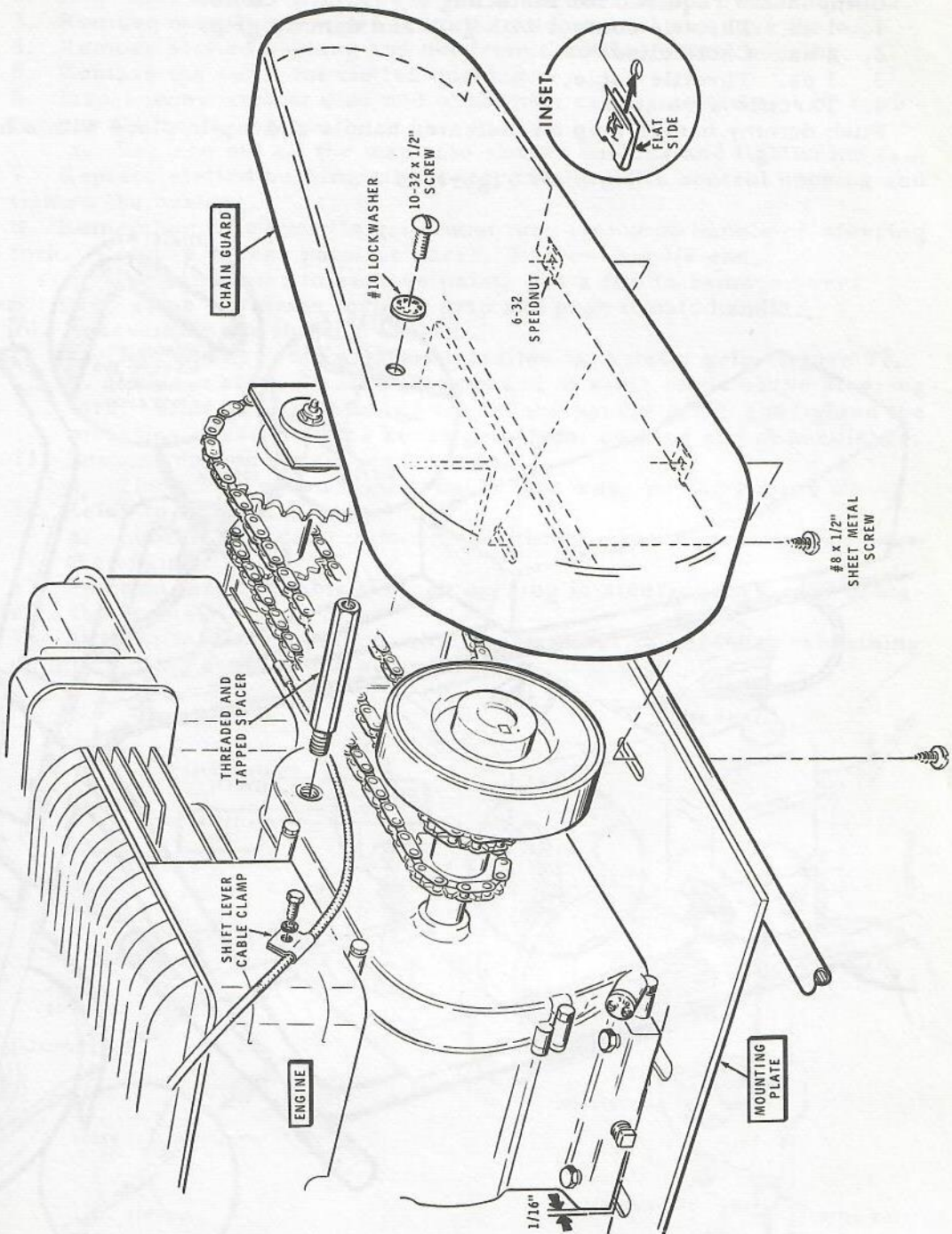


Figure 74



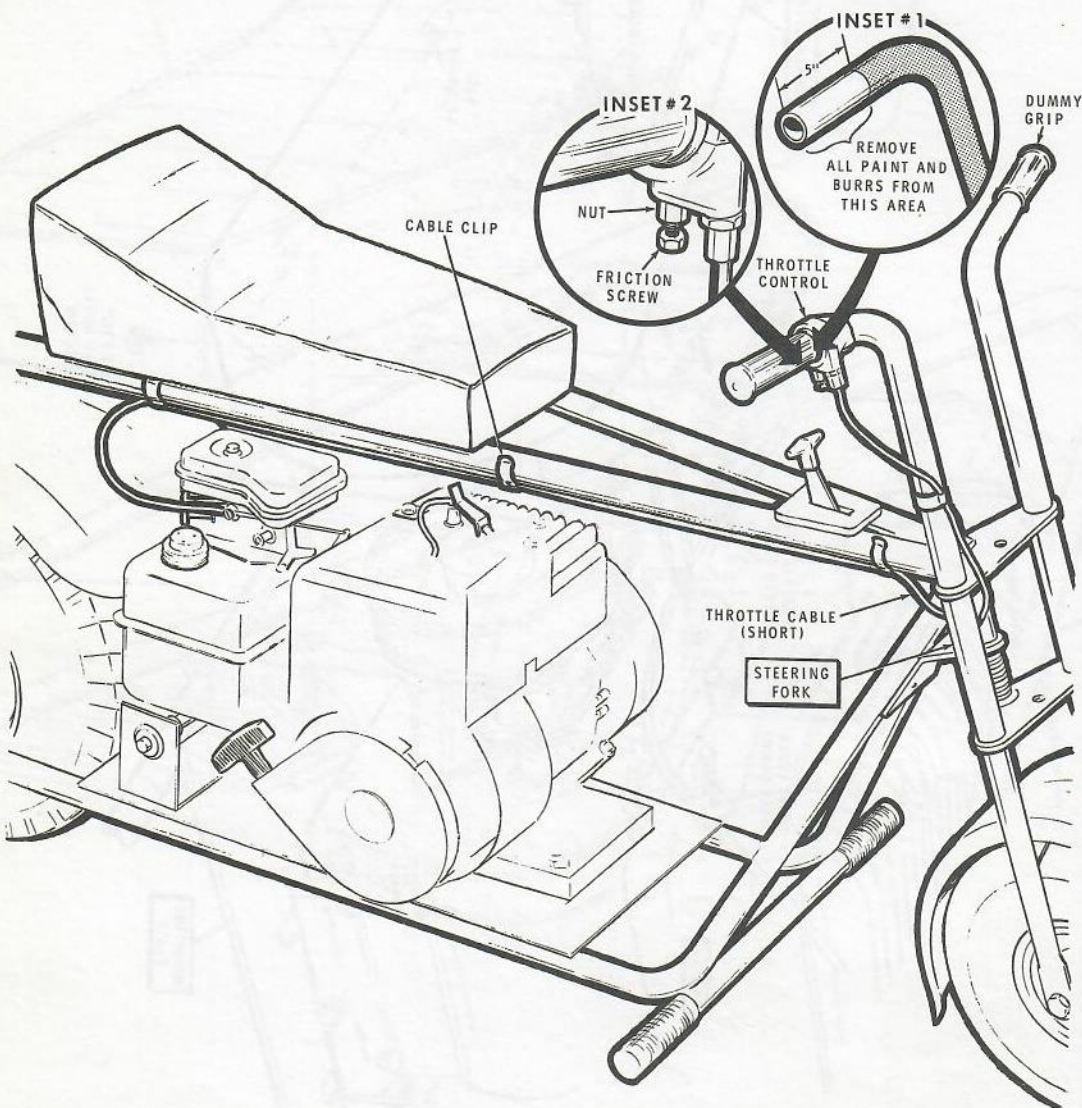
Throttle Control and Cable.

Components required for installing the throttle cable.

1. 1 ea. Throttle control with grip and dummy grip.
2. 4 ea. Cable clips.
3. 1 ea. Throttle cable.
4. Throttle wire stop.

Push dummy handle grip on indicated handle and tap in place with a hammer.

Figure 75



1. Remove ferrule from inner wire of throttle.
2. Heat with soldering iron or torch if needed. Don't overheat cable.
3. Remove mounting screws from throttle control and save them.
4. Remove slotted bushing and nut from throttle control housing.
5. Remove the nut from slotted bushing.
6. Insert inner wire at disc end of throttle cable into the slot of bushing per figure 76, below.
 - a. Replace nut all the way onto slotted bushing and tighten nut.
7. Replace slotted bushing all the way into throttle control housing and tighten the bushing.
8. Remember, the throttle grip must turn freely on handle of steering fork. Remove excess paint or burrs, 5" from handle end.
 - a. Use sandpaper to remove paint, use a file to remove burrs.
9. Drop some oil inside throttle grip and push it onto handle.
10. Reassemble the throttle control.
 - a. Disc end of cable must be installed in throttle grip, figure 77.
 - b. Position slotted bushing downward at same angle as the steering fork. Slide grip assembly back off the handle 1/8", and tighten the mounting screws. This keeps grip from rubbing end of handlebar.
11. Loosen friction screw until it stops.
 - a. The screw doesn't come out all the way, so don't force it.
12. Refer to figure 78, page 70.
 - a. Loosen, but don't remove, the throttle cable mounting screw on the engine.
13. Position throttle cable through opening in steering fork, and alongside the frame.
14. At throttle control end of cable, push metal cap of outer sheathing up into slotted bushing and secure it.

Figure 76

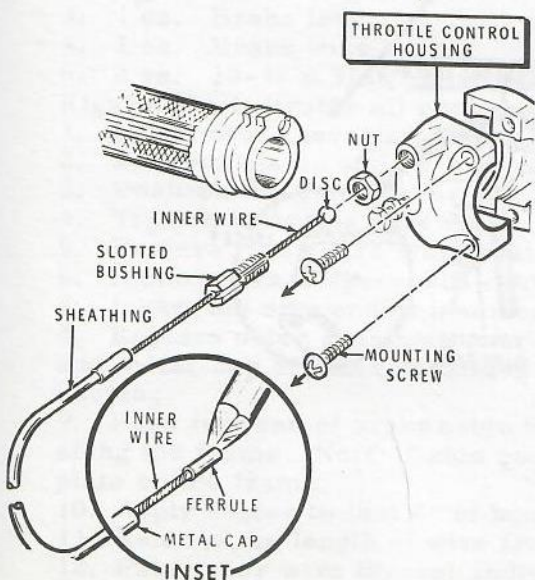
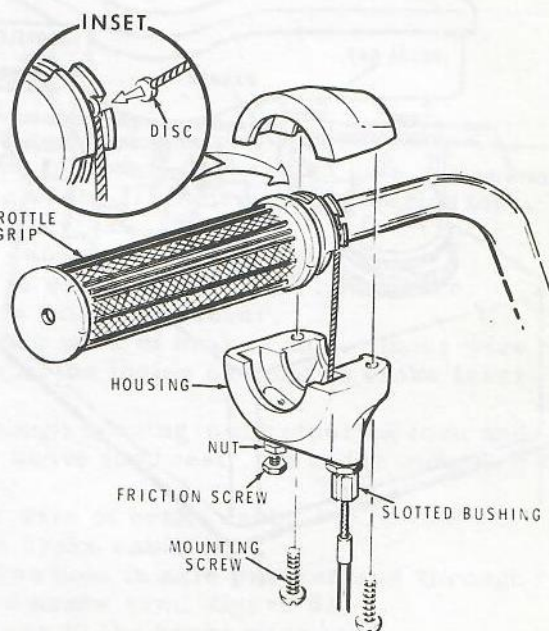
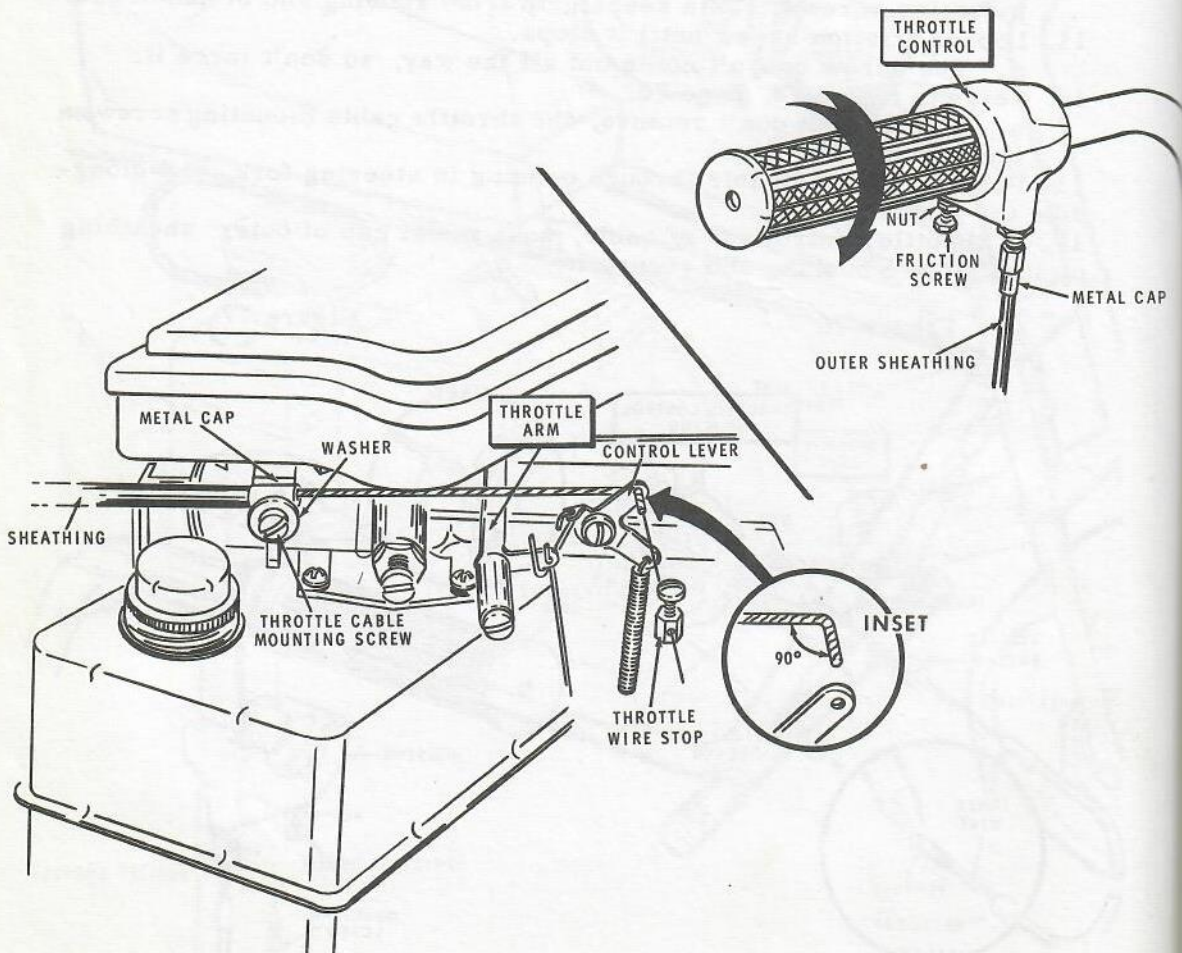


Figure 77



15. Fit metal cap, which is on outer sheathing at free end of the throttle cable, behind washer on the throttle cable mounting screw, and hold it.
16. Pull inner wire as tight as possible. Make a 90 degree bend in the inner wire, where it aligns with hole in control lever on the engine.
 - a. Release the metal cap.
17. Fit inner wire through hole in control lever.
 - a. Install the throttle wire stop on the wire to hold it in place.
18. Replace metal cap behind washer on throttle cable mounting screw. Tighten the screw.
19. When positioning throttle cable at steering fork end, leave enough play for steering fork assembly to turn freely in all directions.
20. Position throttle cable along steering fork and frame as shown.
 - a. Install four cable clips as shown in figure 75.
 - b. Cable must be under top tube of frame as shown.

Figure 78



After installation is complete, recheck operation of throttle control and engine control lever. Operation must follow three steps outlined below. If not, recheck installation procedures.

1. Turn throttle control fully clockwise, looking at outside end of control. The control lever on the engine should be completely forward, in idle position, and there should be some play in the inner cable between the cable mounting screw, and control lever on the engine. There should also be enough slack in inner wire to allow engine to return to idle when throttle control is released. If not, loosen throttle cable mounting screw and move cable outer sheathing forward slightly. Retighten the screw.
2. Turn throttle control counterclockwise, which will pull the control lever toward the rear of the engine. A 90 degree rotation of the throttle control should make the engine control lever move to full throttle position when control lever doesn't move the throttle arm any further.
3. The throttle control, when released, should return freely to its fully clockwise position. The control lever should move to forward, or idle position.

After this phase of operation has been checked out, turn nut on the friction screw counterclockwise.

1. Turn friction screw in slowly, while turning the throttle control back and forth. When you feel a very slight drag on the throttle control, stop turning the friction screw, and back it off about 1/4 turn.
2. Re-check the throttle control by turning it 90 degrees and releasing it. If it returns freely to idle position, tighten the friction nut against the throttle control housing. This should hold friction screw in place. If control doesn't return freely to idle position, back the friction screw off until it does.

Brake lever and cable.

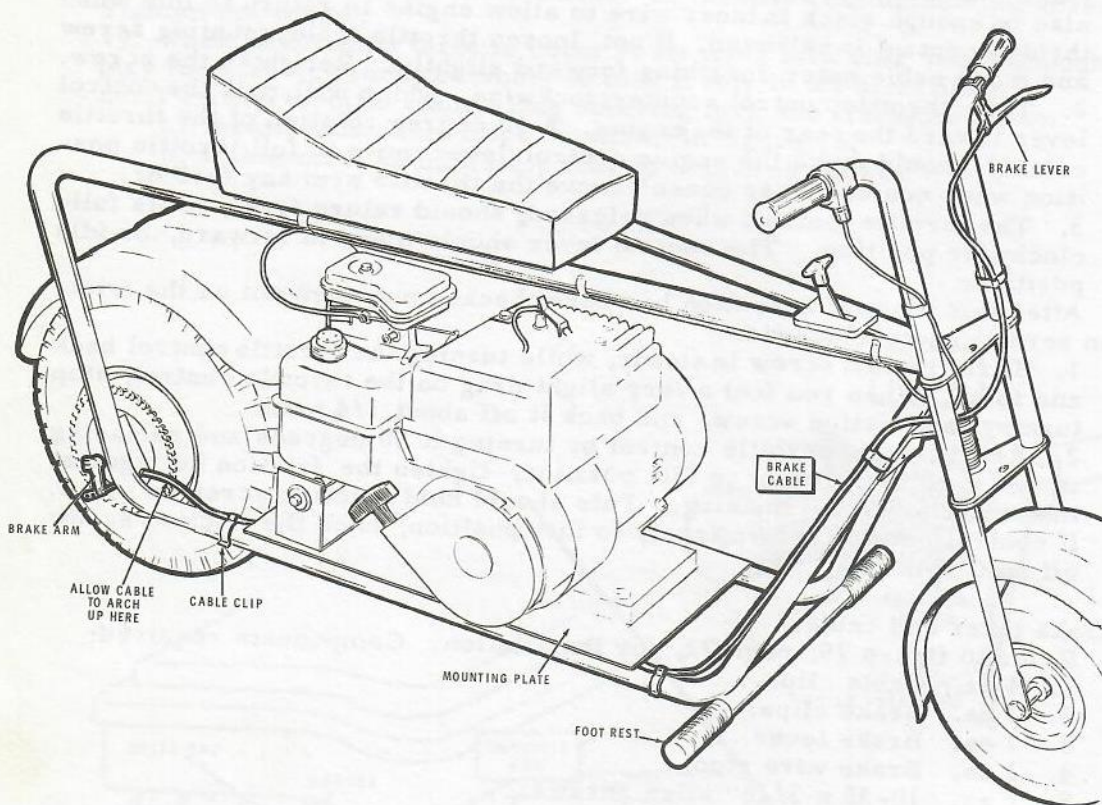
Refer to figure 79, page 72, for installation. Components required:

1. 4 ea. Cable clips.
2. 1 ea. Brake clips.
3. 1 ea. Brake lever.
4. 1 ea. Brake wire stop.
5. 2 ea. 10-32 x 3/16" allen screws.

Figure 80 illustrates all components.

1. Mount brake lever on indicated handle of steering fork.
2. Position clamp until it's about 6" from end of the hand grip.
3. Position the brake lever housing about 1/2" forward of steering fork.
4. Tighten mounting screws.
5. Remove inner wire from brake cable.
6. Remove brass spacers (if cable is so equipped) from inner wire.
7. Insert the disc end of inner cable into brake lever.
8. Replace outer sheathing over inner wire of brake cable. Inner wire and metal cap of outer sheathing must be inside opening in brake lever housing.
9. Pass free end of brake cable through opening in the steering fork and along the frame. Note: Cable goes above foot rest, but under mounting plate on the frame.
10. Apply solder to last 2" of inner wire of brake cable.
11. Remove the length of wire from brake cable stud.
12. Pass inner wire through indicated hole in axle bracket and through hole indicated in brake cable stud on brake arm, figure 81.
13. Start 2 10-32 x 3/16" allen screws in the brake wire stop.

Figure 79



14. Pull inner wire as tight as possible when you secure free end of the brake cable. Push brake arm forward as far as possible before installing the brake wire stop. See arrows in figure 81. Secure end of inner cable with wire stop. Tighten screws in brake wire stop.

15. Allow sufficient slack for turning steering fork and secure the brake cable to the frame with 4 cable clips at indicated locations. Leave slight arch in the brake cable near the rear wheel, when installing the rear brake cable clip.

a. Recheck the brake lever and brake for proper installation.

16. Squeeze the brake lever and check brake shoes. They must expand to engage the brake drum. The rear wheel **MUST NOT** turn if the bike is pushed in either direction. If adjustment is necessary, check distance of adjustment. If brake lever is moved more than 2", move the wire stop farther onto end of brake cable inner wire.

17. When brake lever is released, brake shoes should move away from the drum, and bike should roll in either direction. The brake lever also should return to its full release position. If not, loosen nut on the screw holding lever on brake housing. Loosen screw about 1/2" turn and re-tighten nut, per figure 80.

Figure 80

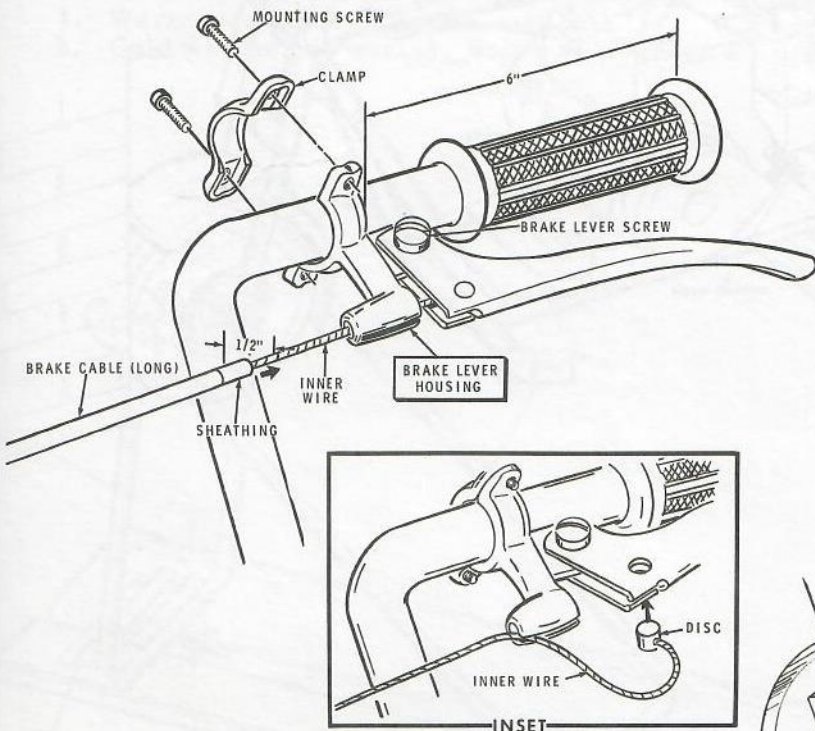


Figure 81

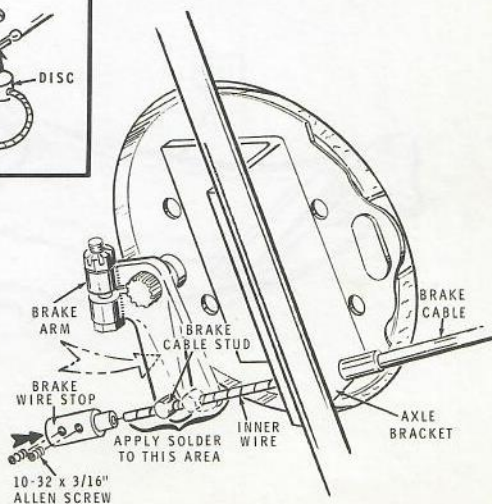
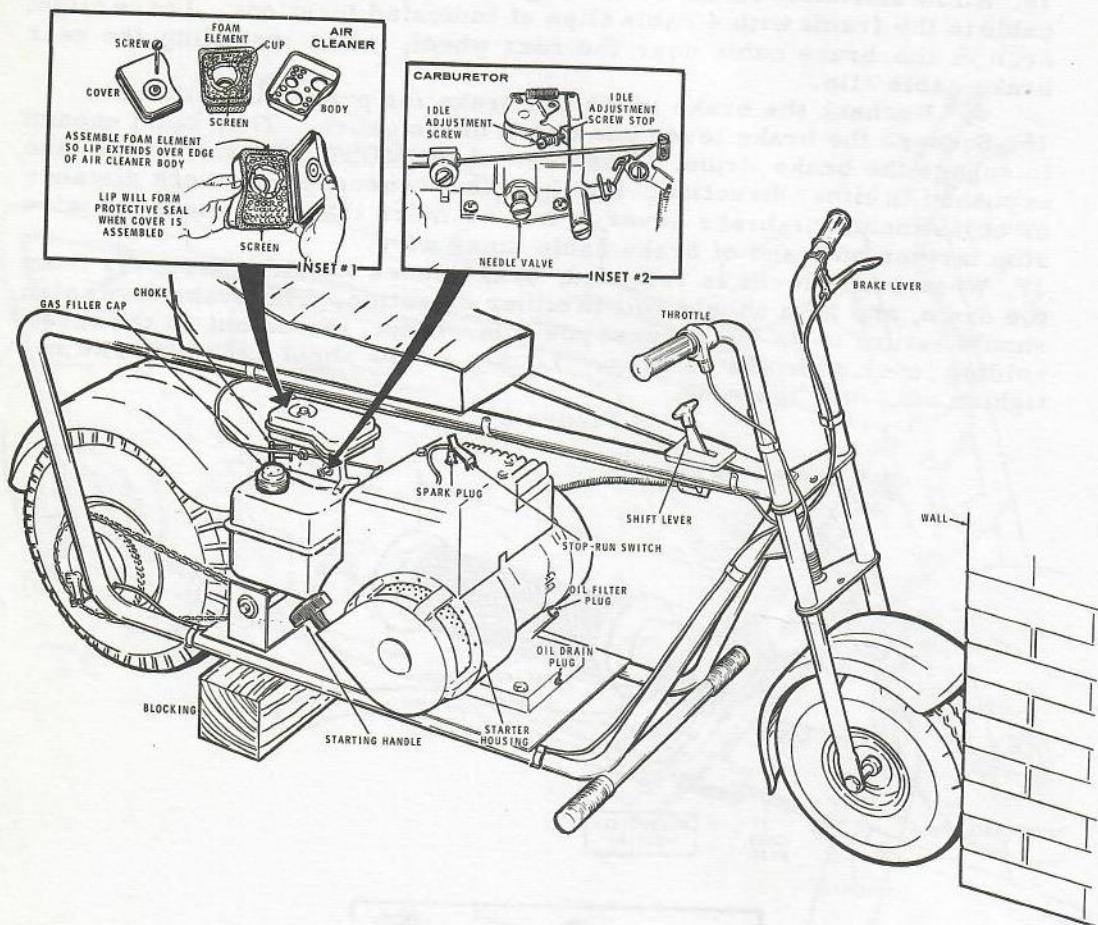
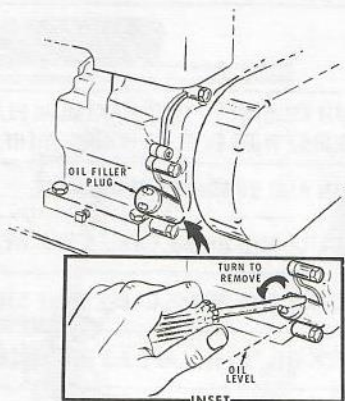


Figure 82



Maintenance.

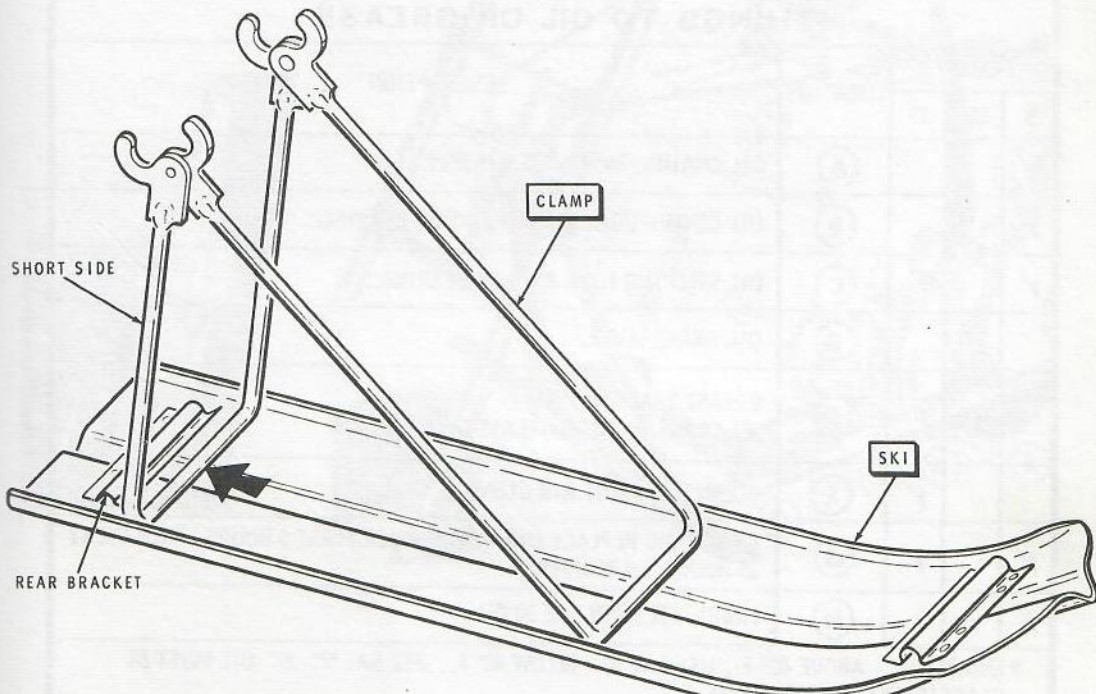
Figure 83



Use only high quality oils in your bike engine.

1. Warm weather or climate, use SAE 30.
2. Cold weather or winter, below 40 degrees F. use SAE 20.

Figure 84



THINGS TO CHECK				
HOURS			LOCATION	DESCRIPTION
5	10	25		
✓			①	CHAIN TIGHTNESS (1/4" MAXIMUM PLAY) EVERY HOUR FOR 5 HOURS. THEN EVERY 5 HOURS THEREAFTER.
✓			②	CHAIN AND SPROCKET ALIGNMENT.
✓			③	THROTTLE AND BRAKE CABLES FOR WEAR.
✓			④	THROTTLE AND BRAKE CABLE WIRE STOPS FOR TIGHTNESS.
✓			⑤	CHECK OIL LEVEL. ADD AS REQUIRED.
	✓		⑥	TIRE PRESSURE. MAINTAIN 10 LBS. P. S. I., FRONT AND REAR.
		✓	⑦	CLEAN AND REGAP SPARK PLUG TO .030".
		✓	⑧	TIGHTEN ALLEN SCREWS.
		✓		CHECK ALL MOUNTING HARDWARE FOR TIGHTNESS AND WEAR.

THINGS TO OIL OR GREASE				
HOURS			LOCATION	DESCRIPTION
5	10	25		
✓			Ⓐ	OIL CHAINS. MORE OFTEN IF DRY.
✓			Ⓑ	OIL CENTRIFUGAL CLUTCH BRONZE BEARING.
✓			Ⓒ	OIL STEERING FORK BRONZE BEARINGS.
	✓		Ⓓ	OIL BRAKE LEVER.
	✓		Ⓔ	GREASE TRANSMISSION. SEE TRANSMISSION GREASE ON PAGE 36.
		✓	Ⓕ	CLEAN AND REOIL AIR CLEANER.
✓		✓	Ⓖ	DRAIN AND REPLACE ENGINE OIL AFTER FIRST 5 HOURS. THEN EVERY 25 HOURS THEREAFTER. *
✓			Ⓗ	LUBRICATE WITH SAE 30 OIL.

* ENGINE OIL. ABOVE 40° F., USE SAE 30. BELOW 40° F., USE SAE 5W-20. OIL MUST BE CLASSIFIED FOR SERVICE MS.

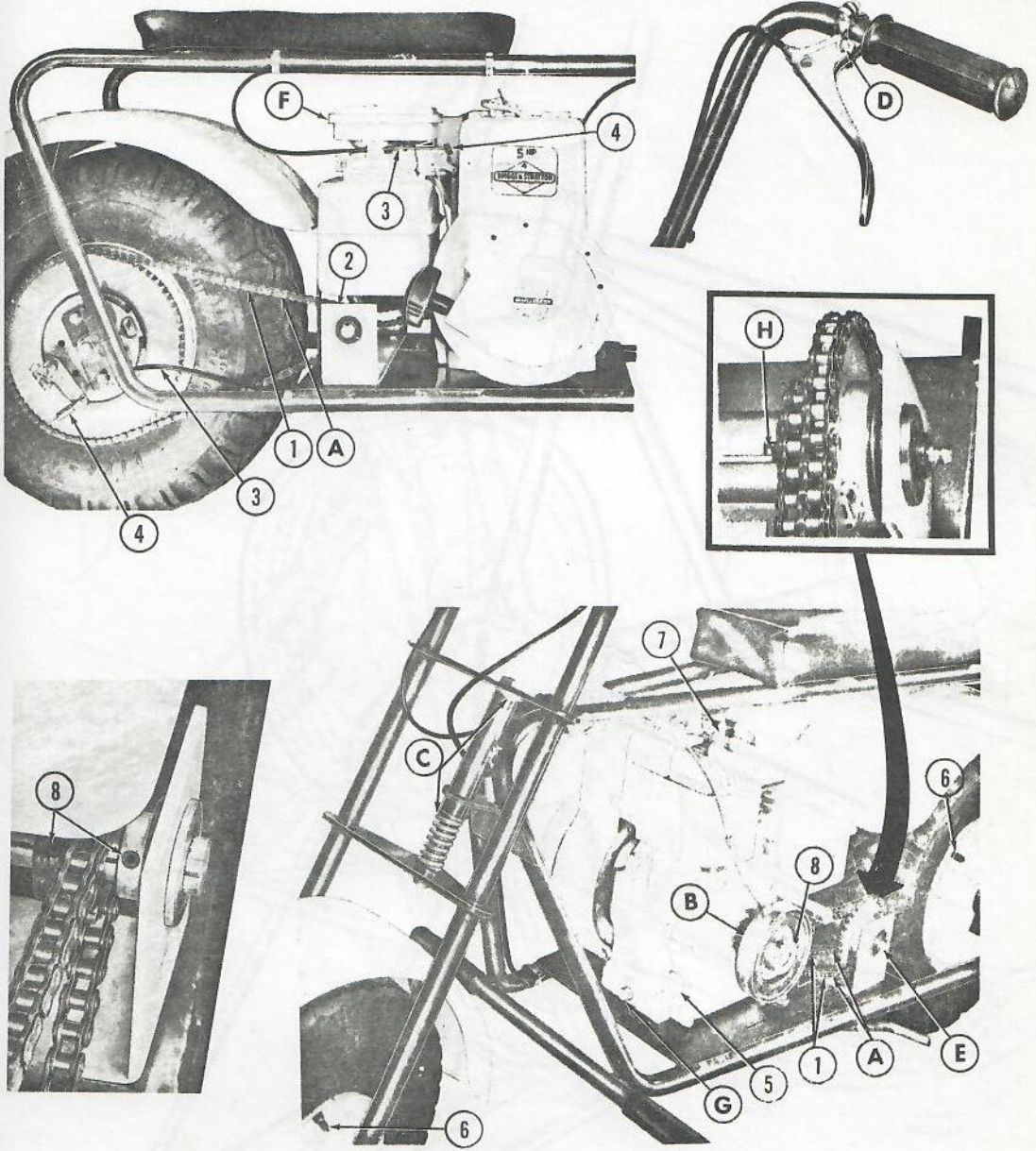


Figure 89

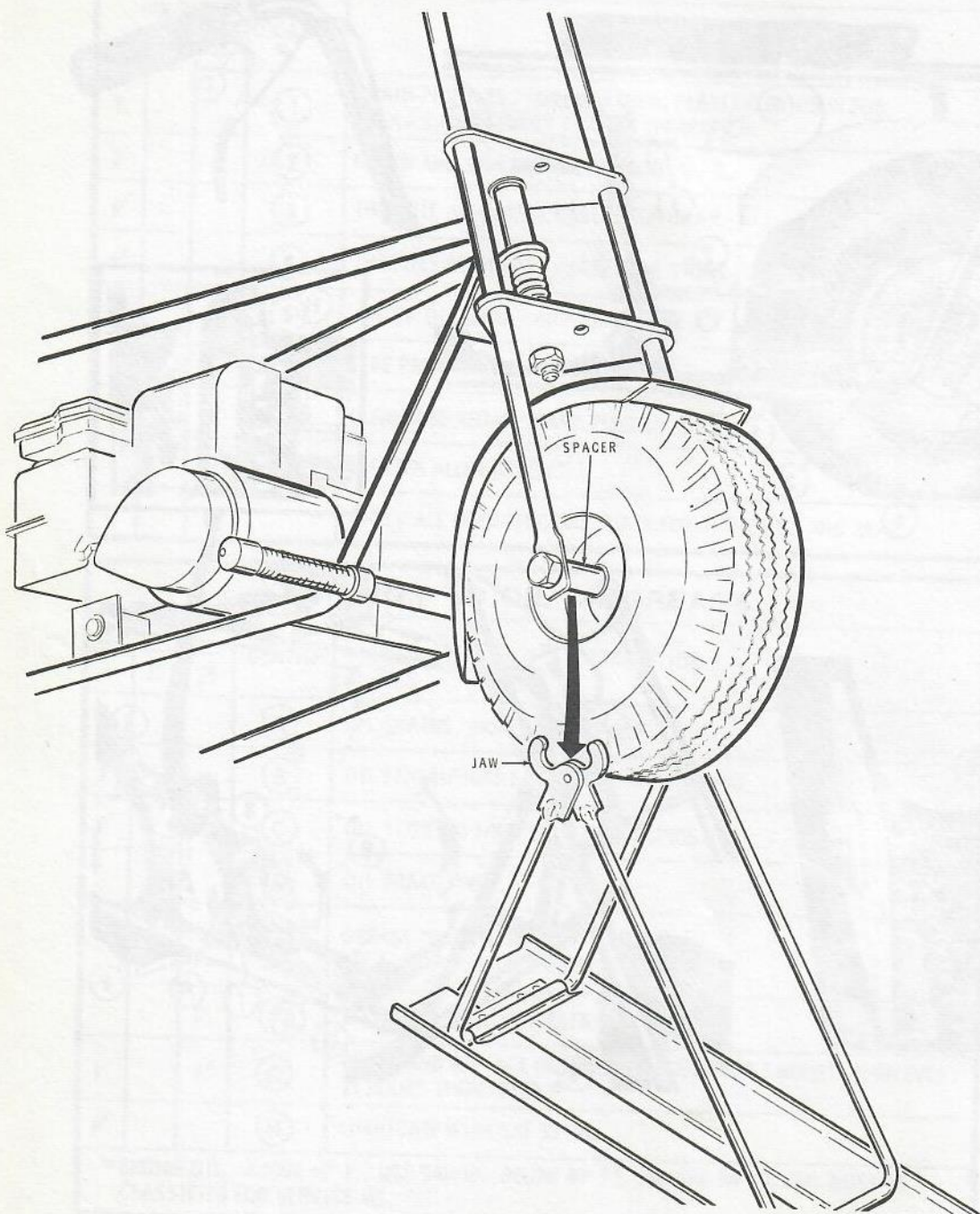
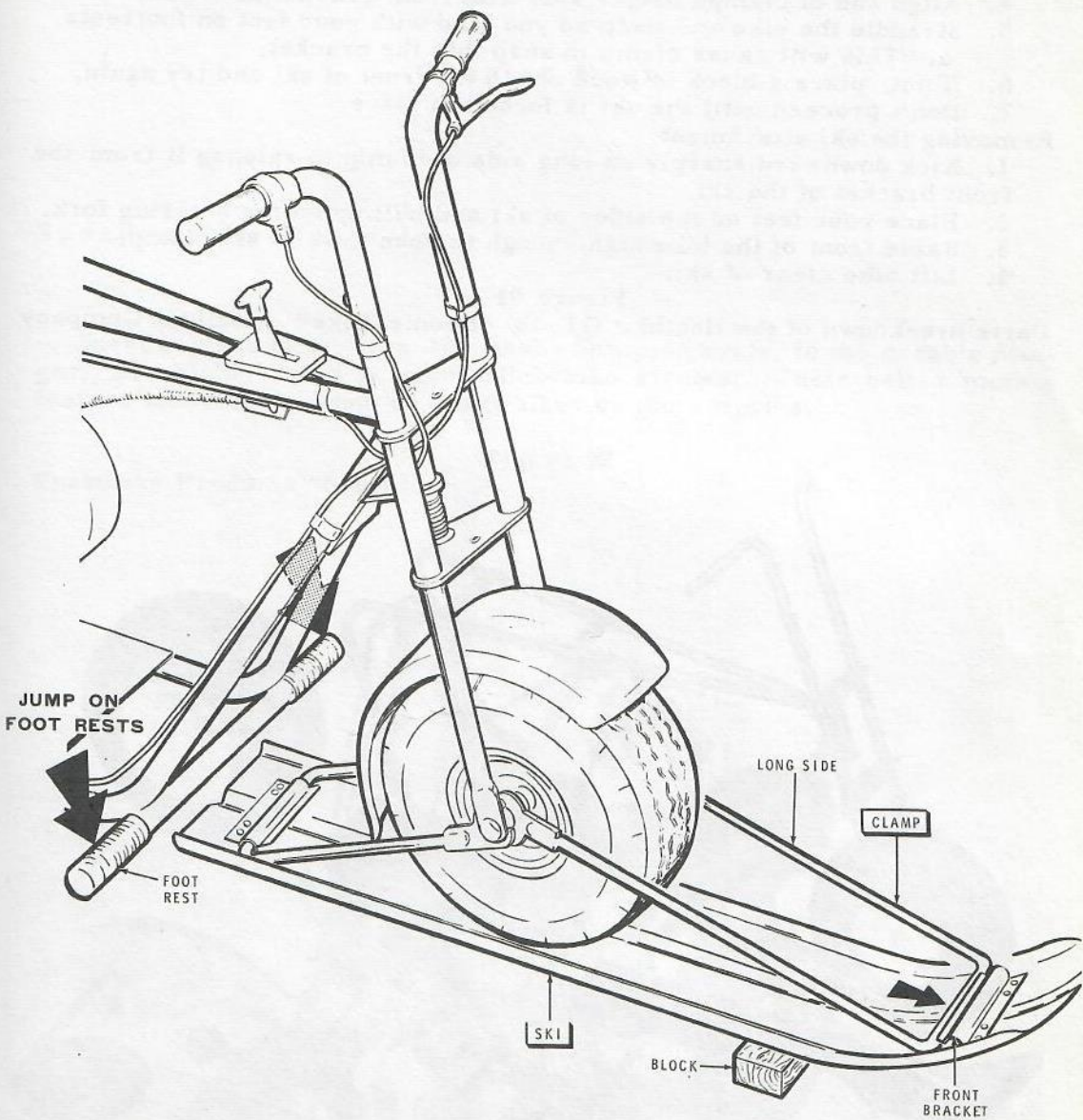


Figure 90



Mounting the ski attachment:

1. Position the clamp with jaws open as illustrated in figure 89.
2. Lift front of bike and position spacers on each side of front wheel in the jaws of the ski clamp.
3. Lower the bike until front tire is resting on the ski.
4. Align end of clamps longer side with front bracket of the ski.
5. Straddle the bike and jump so you land with your feet on footrests.
 - a. This will cause clamp to snap into the bracket.
6. If not, place a block of wood under the front of ski and try again.
7. Don't proceed until the ski is locked in place.

Removing the ski attachment:

1. Kick downward sharply on long side of clamp to release it from the front bracket of the ski.
2. Place your feet on the sides of ski and pull up on the steering fork.
3. Raise front of the bike high enough to open jaws of ski clamp.
4. Lift bike clear of ski.

Figure 91

Parts breakdown of the Heathkit GT-18 "Boonie-Bike" Heathkit Company

